The Journal
OF THE KANSAS MEDICAL SOCIETY

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A single oral dose of 50 mg. of cortisone acetate in healthy individuals is followed by an increase in the neutrophil count and decrease in the lymphocyte and eosinophil counts, during the first few hours after giving the drug.

Kowalski, et al., J. Lab. & Clin. Medicine, Vol. 40, P. 841 (Dec. 1952)

Pathologically Speaking

ANEMIA

THE discovery of anemia is a common observation in clinical medicine. Anemia is stated to exist when hemoglobin is below 12 grams per 100 m. l. of blood. It is not a disease, per se, but a symptom of disease, and therefore, should be carefully investigated to find its cause.

The physician should make an effort to classify anemias into one of three groups, on the basis of morphologic changes in red cells. Classification is imperative because the treatment for various groups is different.

The anemia due to blood loss is usually not aided by the administration of iron, folic acid, liver or B_{12}. In hemolytic anemias no benefit will be derived from these agents. On the other hand, the nutritional macrocytic anemias will definitely be aided by these therapeutic agents.

When anemia is present, the following laboratory data will be of great value in establishing a correct diagnosis: (1) Estimation of red cell count, hemoglobin and hematocrit; (2) Estimation of white cells; (3) Estimation of platelets, and (4) Study of stained film of blood for morphology of cells.

The above named procedures are ones easily performed and those considered to be a basic part of any laboratory examination.

The reticulocyte count and serum bilirubin are two additional procedures which are of value because the reticulocyte count gives information as to the production of red cells. Reticulocytosis usually is seen in the hemolytic anemias or following acute blood loss, and is a good index of response to therapy, when liver, B_{12} or iron are used. In aplastic anemias the reticulocyte count is low, as it is in many anemias associated with infections.

Serum bilirubin offers information as to the rate of destruction of red cells. The fraction is elevated in many hemolytic anemias.

The calculation of Mean Corpuscular Volume, Mean Corpuscular Hemoglobin and Mean Corpuscular Hemoglobin Concentration aids considerably in diagnosis of anemias, because the indices, as obtained, enable one to place the anemia into one of three groups based on morphology of the red cell.

Mean Corpuscular Volume is the expression of the average volume of the individual red cells in absolute terms. The cell may be normocytic, macrocytic or microcytic.

Mean Corpuscular Hemoglobin expresses the average content of hemoglobin of each cell. This will depend upon (1) the size of the cell and (2) hemoglobin content.

Mean Corpuscular Hemoglobin Concentration indicates the concentration of hemolglobin in each cell. This factor is never greater than normal value, for cells cannot be supersaturated; it is very low in hypochromic anemias.

The use of these laboratory aids, as outlined, will usually make it possible to classify the existing anemia. Proper classification of the anemia directs the physician's attention to certain etiologic factors and places therapeutic efforts on a sound basis.

RALPH EMERSON DUNCAN, M. D.
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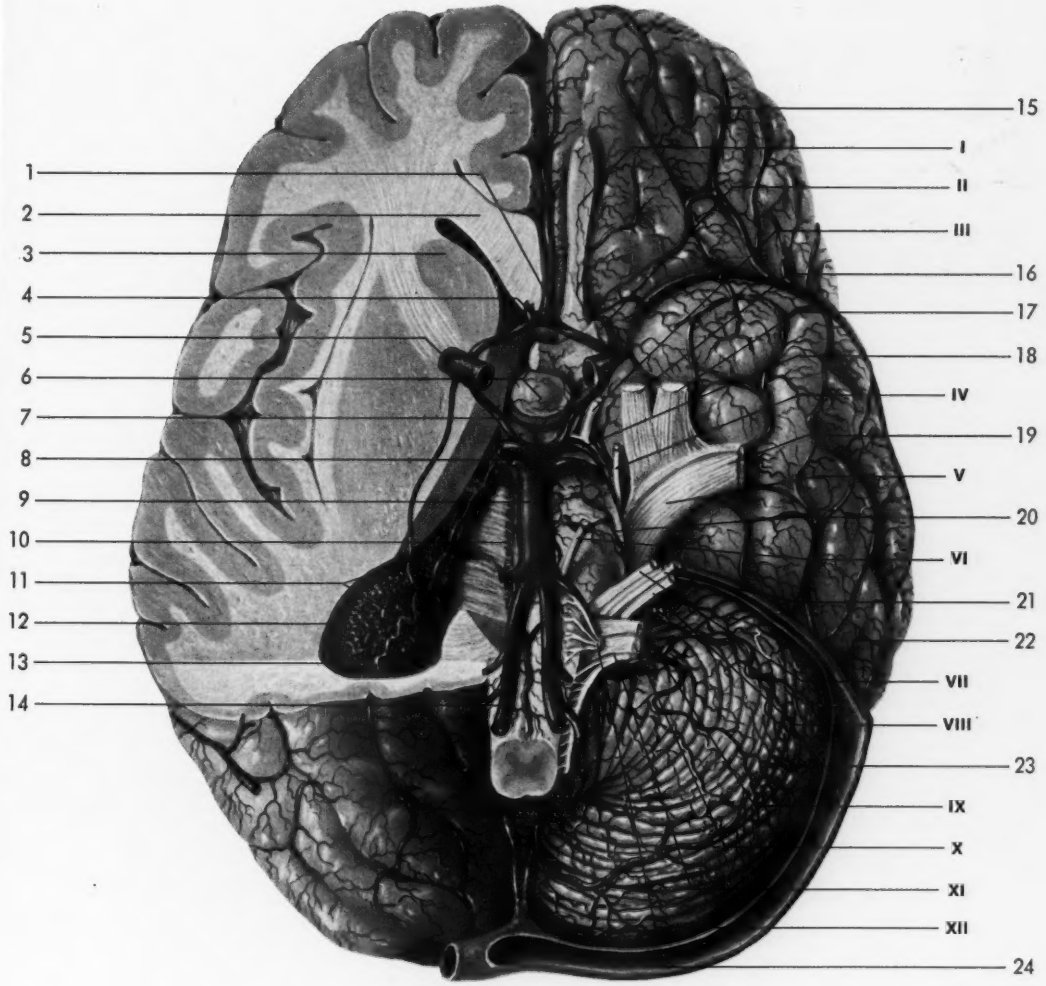
Anatomy *of the* Brain



1. Anterior cerebral artery
2. Trunk of corpus callosum
3. Head of caudate nucleus
4. Anterior communicating artery
5. Middle cerebral artery
6. Hypophysis
7. Posterior communicating artery
8. Superior cerebellar artery
9. Basilar artery
10. Internal cerebral vein
11. Choroid artery and vein
12. Choroid plexus of lateral ventricle
13. Inferior cornu of lateral ventricle
14. Vertebral artery
15. Frontal lobe
16. Ophthalmic nerve
17. Maxillary nerve
18. Posterior cerebral artery
19. Mandibular nerve
20. Pons
21. Intermediate nerve
22. Temporal lobe
23. Cerebellum
24. Left transverse sinus

CRANIAL NERVES

I. Olfactory nerve
II. Optic nerve
III. Oculomotor nerve
IV. Trochlear nerve
V. Trigeminal nerve
VI. Abducens nerve
VII. Facial nerve
VIII. Acoustic nerve
IX. Glossopharyngeal nerve
X. Vagus nerve
XI. Accessory nerve
XII. Hypoglossal nerve

This is one of a series of paintings by Paul Peck, illustrating the anatomy of various organs and tissues of the body which are frequently attacked by infection, where aureomycin may prove useful.

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Aureomycin

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Intracranial Infections

BECAUSE the urgency of intracranial infections frequently makes it desirable to begin treatment before the causative organism can be determined, there is need for an agent exerting rapid action, which is also effective against a wide range of possible pathogens. Aureomycin—with its ready penetration into the cerebrospinal fluid and its broad antimicrobial spectrum—fills this need pre-eminently well. It is particularly useful in infections resistant to penicillin and streptomycin, and has been used successfully in meningitis caused by *E. coli*, *A. aerogenes*, *Ps. aeruginosa*, *H. influenzae*, staphylococci, pneumococci, *Klebsiella pneumoniae*, *Str. fecalis*, the typhoid bacillus, *Salmonella bareilly*, *Listeria monocytogenes*, and *Moraxella lwoffi*. In meningoencephalitis complicating brucellosis and in encephalitis complicating typhoid, paratyphoid and pertussis infections, aureomycin has proven effective. Impressive clinical improvement has been achieved with aureomycin therapy, after other antibiotics proved unavailing, in infected intracranial hemorrhage, subdural abscess caused by *A. aerogenes*, and brain abscess caused by staphylococci, pneumococci, and *E. coli*.

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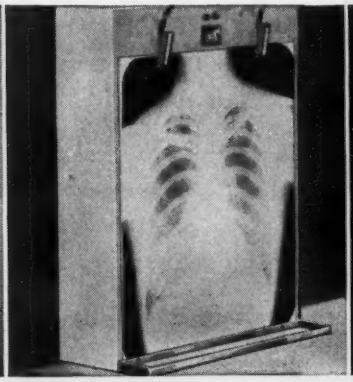

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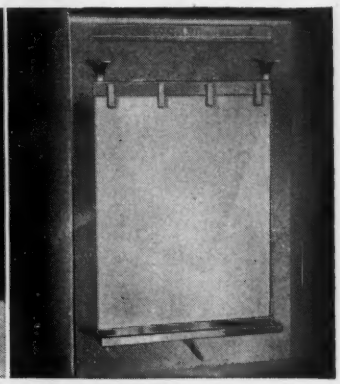

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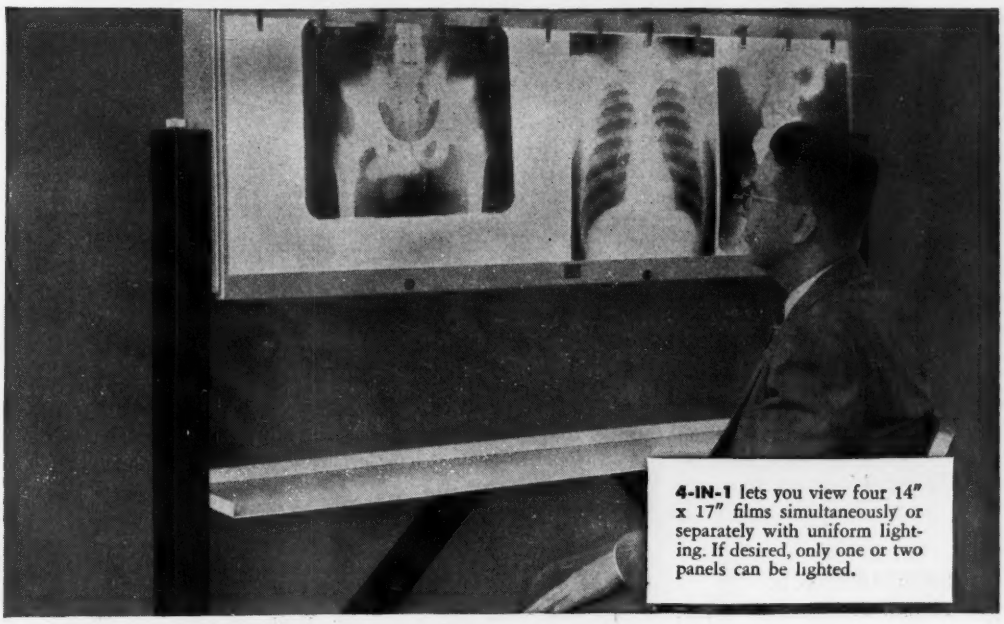

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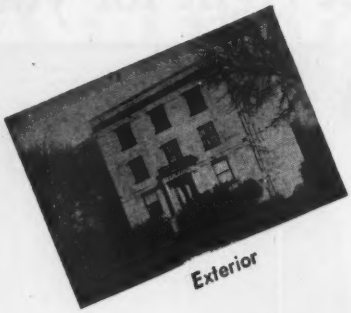

Exterior

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Day Room

The older psychiatric patient frequently suffers from an irreversible type of organic reaction. The new Geriatric Unit at the Neurological Hospital has been established to provide medical and nursing care for the patient of this type. The hospital is equipped with an elevator and ramps so that bed-ridden and very ill patients may be taken out-of-doors. In the opinion of the fire department and the insurance engineer, this unit is the most fire-resistant human occupancy building in Greater Kansas City. The curtains are glass fabric and the walls are covered with fire-resistant cloth wallpaper. The fire escape is large enough so that bed-ridden patients could be carried down quite easily. This is a very important factor, considering the large numbers of catastrophic fires that have occurred in "homes" for the aged in recent yars.

Inquiries may be directed to the hospital or to the individual psychiatrist.

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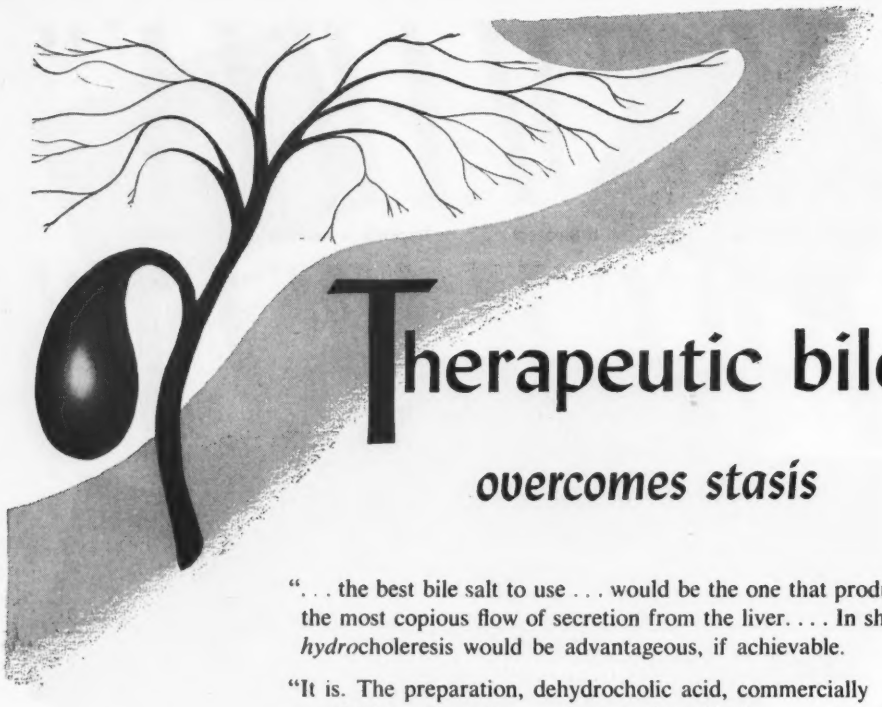

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*Beckman, H.: Pharmacology in Clinical Practice, Philadelphia, W. B. Saunders Company, 1952, p. 361.

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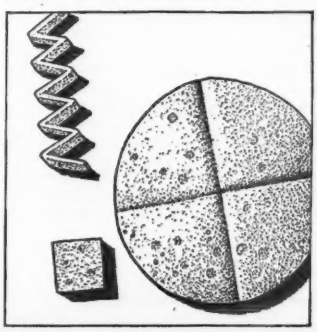

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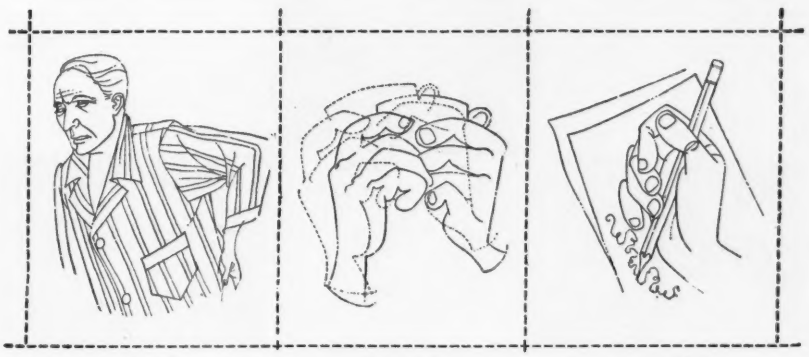

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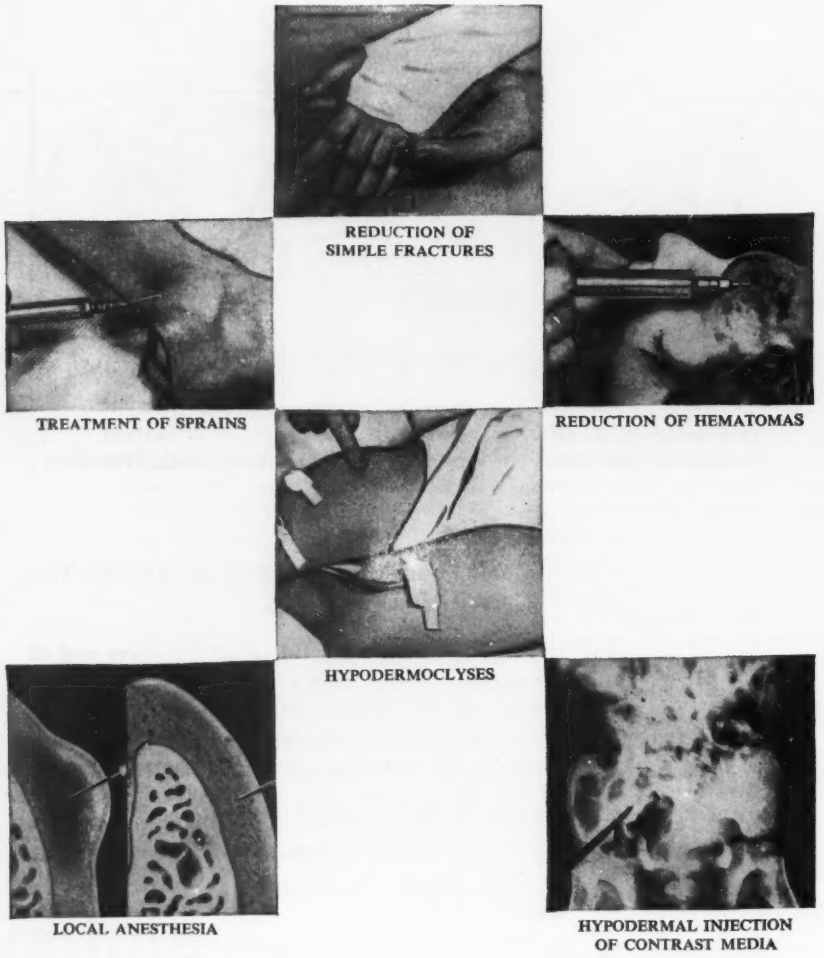

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Meat...

and the Therapeutic Value of Adequate Protein

Much evidence can be cited in favor of a high protein intake after surgery, trauma, infection, or burns. In supporting the many anabolic and defense mechanisms of the organism in physiologic stress,[1] high-quality protein—such as that of meat—assumes the status of an important therapeutic agent.[2]

Phagocytic activity,[3] formation of antibodies,[4] and rapid healing of wounds[5] are favorably affected by ample protein nutrition. Remission of peptic ulcer,[6] improved resistance to infectious disease,[4] and maintenance of plasma proteins after surgery[7] are other therapeutic effects attributed to an ample protein intake. In the management of ulcerative colitis, protein represents a primary need.[8] Recent advances in the treatment of extensive burns and of hepatic disease emphasize the value of high protein feedings.[9]

These experimental and clinical findings establish the therapeutic value of high protein intake.[10] To assure therapeutic protein adequacy, the dietary should provide a liberal margin of protein over normal requirements.

Meat is an important source of high-quality protein, containing essential as well as nonessential amino acids. In addition, it supplies significant amounts of B group vitamins and of iron, phosphorus, and other needed minerals.

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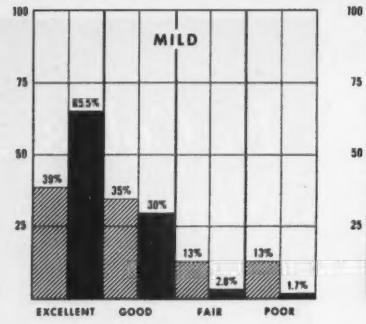

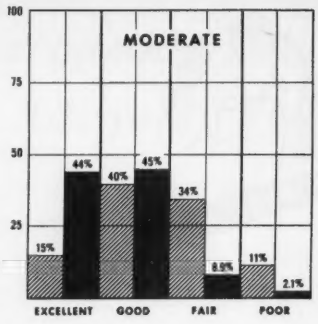

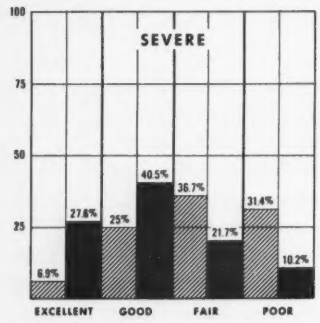

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The Evaluation of Operative Risk in Patients With Cancer*

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New York, New York

Operative risk can be defined as the percental chance of the patient's survival. In a broader sense, it must also include an estimation of the incidence of complications, the length of convalescence and the loss of recovery of function as a result of surgery.

Any associated diseases, estimation of the efficacy of vital function, and the delineation of the state of cancer should be accurately defined preoperatively. Then, and only then, can a comprehensive attack on the disease be planned both as regards surgery and continued life-time care of the patient.

The fact that two-thirds of the postoperative deaths occur in patients 55 years of age or more emphasizes the importance of determining the physiological age of the patient. The operation affects the risk according to the magnitude of the strain or stress that it puts on vital systems. Such strain is influenced by the duration of the operation, the anesthetic, the surgical technique and alterations in anatomy, physiology and function resulting from the surgical procedure.

A comprehensive history and a careful, skillful physical examination almost always uncover the presence or probability of complicating disease. It is difficult to exaggerate the importance of the information so obtained. For example, exact knowledge must be available, not only with regard to the nature and extent of the cancer but also exact information concerning the state of nutrition, the soundness of the circulation, and the adequacy of renal and respiratory function. Minimum laboratory data usually needed for evaluation of the operative risk for the patient with cancer who is to have major surgery should include a complete hemogram; an urinalysis; estimations of the blood urea, nitrogens, chlorides, cholesterol, protein, sugar, bilirubin, prothrombin time and, if possible, a knowledge of the level of the blood sodium, potassium and blood volume. A chest x-ray and an electrocardiogram are important preoperative laboratory studies. Further studies or function tests will be needed to evaluate the severity of any associated diseases thus uncovered.

The presence of certain disease states greatly increases the operative risk. If not recognized and treated promptly preoperatively, they may lead to the death of the patient. The selection of problems for discussion here has been made on the basis of a study of the pre- and postoperative complications most frequently contributing to increased morbidity and mortality of patients undergoing major surgery for cancer.

Many patients with carcinoma, by the time they reach the surgeon, exhibit some evidence of nutritional deficiency. To estimate this, the importance of history cannot be over-exaggerated. Weight loss should be determined, not only in pounds lost but in percentile weight loss. Any patient who has lost more than 20 per cent of his normal body weight will have certain nutritional problems that must be corrected prior to any major surgical procedure.

In the dietary history, it is not only important to know if the patient has had an adequate caloric intake, but just what types of foods he has been eating. For example, the patient may have lost 40 pounds in weight, but the dietary history will disclose that he has had more than adequate protein intake and he may be in relatively good nutritional balance preoperatively. On the other hand, an individual may not have lost much weight at all, but because of the distaste so many cancer patients have for protein, may have significant protein deficiency.

Routine blood counts and hematocrits may sometimes give us misleading information relative to red blood cell mass and plasma volume. It has been

*Presented at the Fourth Annual Mid-West Cancer Conference, Wichita, Kansas, April 3 and 4, 1952.

**From the Department of Medicine, Memorial Center for Cancer and Allied Diseases.

demonstrated that 70 per cent of patients with cancer coming to surgery have a deficiency in the blood volume, usually in the red blood cell mass, although the ordinary red count, hemoglobin, and hematocrit may be well within normal limits. When blood volume determinations are not available, approximation of this deficiency can be arrived at by the weight loss (assuming the normal blood volume to be 85 cc. per kilogram of body weight). Thus, if the patient has lost 10 kilograms of weight, it can be estimated that he will need 85 cc. of blood per kilogram for each kilogram of weight loss, and a transfusion of 850 cc. would therefore be indicated preoperatively.

TABLE 1

PREOPERATIVE VALUES*

Average Red Cell Count, Hemoglobin and Hematocrit

	9 CA Pan.	6 CA Amp. & Duod.
Red Blood Count	4.26 (3.2)	4.40 (4.1)
Hemoglobin	13.3 (11.6)	14.4 (13.5)
Hematocrit	42.6 (38)	41.6 (35)
Plasma Protein	7.03 (6.0)	7.4 (6.1)

*Unpublished data H. T. Randall—Memorial Center, New York City.

Table 1 lists the average values of hemoglobin, hematocrit and plasma protein for 15 patients with cancer of the pancreas, Ampulla of Vater or duodenum, the figures in parentheses indicating the lowest level. Blood volume determination, however, revealed a frequent discrepancy in red blood cell mass, plasma volume being frequently at or above normal levels (Table 2). Such data demonstrate

TABLE 2

BLOOD VOLUME DETERMINATIONS*

Preoperative 12 Cases (Before transfusion)

Plasma Volume % Normal		Red Cell Mass % Normal	
120-110%	2	100-90%	1
110-100%	5	90-80%	4
100- 90%	3	80-70%	2
90- 80%	1	70-60%	3
62%	1	60-50%	1
		47%	1

*Unpublished data H. T. Randall—Memorial Center, New York City.

the difficulties of assessing operative risk by routine methods in chronically ill patients. Unless blood deficiencies are corrected preoperatively, shock is prone to develop during surgery or postoperatively. Wound healing is impaired by such deficiencies.

Chart I illustrates the importance of chronic shock. In a patient who had a hysterectomy for menorrhagia of unknown cause, later proved to be due to cancer, the red blood cell count and hemo-

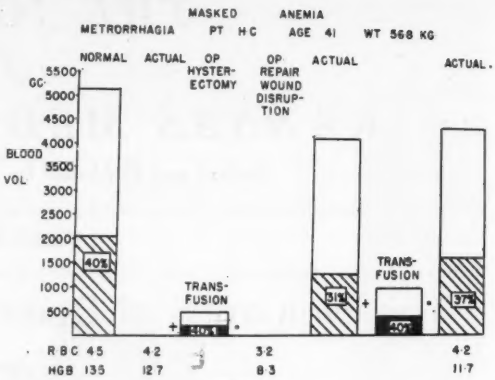

Chart 1

globin were within normal limits preoperatively. During surgery more than the estimated blood loss was replaced by a 500 cc. transfusion. Wound disruption developed on the sixth postoperative day, and blood volume determination revealed an essentially normal total blood volume but a significant red blood cell mass deficiency of 750 cc., not corrected by giving a 1000 cc. blood transfusion. Such complications could probably have been avoided had the red blood cell mass deficiency been corrected preoperatively. The chronic shock syndrome described by Champ Lyons is commonly encountered preoperatively. Patients with cancer giving histories of weight loss and inadequate food intake should lead the clinician to suspect blood volume abnormalities.

Protein deficiencies are extremely common, particularly in gastric carcinoma, occurring in 60 per cent of such patients. Twenty per cent of patients with carcinoma of the colon have measurable protein deficiency. It is impossible to replace such protein deficiency unless any red blood cell mass abnormality is corrected first. Then, the daily administration of 100 to 150 grams of protein, by mouth, or parenterally if necessary, in the form of plasma or protein hydrolysates may be attempted. One thousand cc. of plasma will only raise the blood protein level one gram per cent, and this elevation may be temporary. All patients subjected to major surgery, and particularly those with gastrointestinal cancer, should be in positive nitrogen balance prior to operation, since we know a negative nitrogen balance occurs postoperatively.

Although cancer is a semi-emergent situation, surgery should be delayed until the patient is properly prepared. It is estimated that if a patient loses 10 per cent of his body weight, it usually requires five to seven days to prepare him adequately for major surgery; if he loses 20 per cent, 10 to 12 days; when more than 25 per cent has been lost, as long as 15 to 30 days may be needed to correct

protein, blood volume and other abnormalities preoperatively. Vitamins are given routinely, and it is our custom to administer massive doses of Vitamin C (500 mgm. daily) and Vitamin B Complex in amounts five to six times the daily requirement. This will not only help prepare the patient for surgery, but will also promote wound healing.

Space does not permit discussion of the various physical signs of nutritional deficiency, but the appearance of unexplained edema, purpura, the development of a red, beefy tongue and certain skin lesions with which you are all familiar should suggest vitamin deficiencies.

It might be worthwhile to point out that the diabetic patient does not represent a serious operative risk per se, but only because of the associated arteriosclerotic processes that are so common in this disease.

Masked hypo- and hyperthyroidism often result in fatalities at the operating table, or in the immediate postoperative period. These can be recognized by a careful history and physical examination, and by attention to the levels of blood chemistries suggested as base line data for all patients who have major procedures for cancer.

Adrenal and pituitary deficiency may be suspected in the patient who is sensitive to cold, who has a low blood pressure, and whose electrolytes preoperatively are not normal. Such patients, once considered almost prohibitive operative risks, can now be satisfactorily prepared by replacement therapy with ACTH or cortisone.

The presence of liver disease preoperatively increases operative risk. Certain contraindications to major surgery include the presence of active hepatitis, and when measurements of the liver function indicate severe parenchymal damage, one should hesitate about surgery and should consider the possibility of metastatic disease in the liver. Thymol turbidity levels of 10 units or more, bromsulfalein retention of 50 per cent or more, concomitantly low cholesterol and cholesterol esters, depression of the albumin-globulin ratio, cephalin flocculation of three or four plus, and a prothrombin time that fails to rise to normal limits after the administration of Vitamin K, indicate parenchymal liver disease. Sometimes proper hydration, replacement of blood volume deficiencies, vitamin supplements (especially of B Complex) and high protein intake may result in a significant reversal of these abnormal values of liver function, and the patient can then be considered as a suitable risk for major surgical procedure.

Among the poor risk patients encountered in cancer and other disease, those with cardiovascular abnormalities perhaps lead the list. We should not be misled by the presence per se of an abnormal electrocardiogram, but congestive failure must be treated adequately and promptly and the patient should be compensated for two weeks prior to any major surgery.

Individuals who have had myocardial infarctions within three months, patients with nocturnal dyspnea as a result of hypertensive cardiovascular disease, status anginosa, active myocarditis or pericarditis, aortic disease and marked cardiac enlargement are notoriously poor risks, since at operation such patients are subject to sudden falls in blood pressure, arrhythmias and fresh myocardial infarctions, and tend to be subject to serious postoperative complications. Of less serious import is the presence of heart block, aneurysm of the aorta, sinus tachycardia, healed myocardial infarct and controlled auricular fibrillation.

Patients with congenital heart disease and constrictive pericarditis, although representing increased risk, can be prepared over a period of time with good expectation of surviving major surgery. Active myocarditis, however, is a positive contraindication to any but the most emergent surgery. Arrhythmias too often go unrecognized and untreated preoperatively, as found in the elderly individual with an irregular pulse, but not markedly so, and a normal heart rate, who proves to have auricular fibrillation if an electrocardiogram is taken. When such patients are operated upon, their pulse rate may rise excessively and they may develop acute pulmonary edema and succumb either at surgery or in the immediate postoperative period.

The presence of multiple extrasystoles preoperatively is a foretoken of the development of paroxysmal arrhythmia during surgery and during the postoperative period. Patients with chronic cor pulmonale are extremely bad risks because they have heart disease as the result of extensive lung disease. These patients frequently have polycythemia, and should their hematocrits be 55 per cent or more, they do better when they have phlebotomies as preoperative preparation. Transfusions must be given sparingly during the operative and postoperative periods.

Patients with heart disease are susceptible to postoperative complications. Congestion in the vascular tree may precipitate pulmonary, renal, or cerebral complications. These patients are also less tolerant of complications once they develop. The presence of atelectasis or mild pneumonitis may lead to irreversible heart failure. Such patients should have parenteral fluid given sparingly. It is not uncommon to have acute left ventricular failure or pulmonary edema develop in the patient given injudicious amounts of blood, parenteral fluids and saline. Intelligent use of digitalis, diuretics and oxygen are often life saving.

Table 3 summarizes the mortality rates encoun-

TABLE 3

Author	Hickman	Barnes	Senturia	Brumm-Willius	Levine	Love	Sprague
Total Patients	336	35	446	257	414	78	76
% Mortality	2.0	0	1.5	4.3	6.3	18	24.7
RHD (total)	60	....	....	....	120	16	....
% Mortality	1.6	....	....	....	2.1	0.6	....
HCVD (total)	91	....	446	100	40	29	....
% Mortality	3.0	....	1.5	0	1.0	3.4	....
ASHD (total)	44	....	....	1	138	34	....
% Mortality	0	....	....	....	4.9	29	....
Infarct (total)	8	22	....	32	20	....	....
% Mortality	12	0	....	....	40.5	....	....
Angina	3	3	....	....	35	....	....
% Mortality	33	0	....	....	7.7	....	....
Block (total)	11	....	....	....	....	....	....
% Mortality	0	....	....	....	....	....	....
Failure (total)	20	10	....	....	50	....	....
% Mortality	10	0	....	....	17.1	....	....
Syphilis (total)	....	....	....	....	11	....	....
% Mortality	....	....	....	....	9.1	....	....

tered in patients with heart disease of varying etiology who were subjected to major surgery. Patients with rheumatic heart disease tolerated surgery surprisingly well, with mortality rates from 0.6 to 2.1 per cent. Hypertensive cardiovascular disease increased the risk but slightly, the highest reported mortality being 3.4 per cent. As many as 29 per cent of patients with arteriosclerotic heart disease may not survive major surgery, although there is considerable variability in the different figures listed. Patients with healed myocardial infarcts are not prohibitive risks, the operative mortality being 5.6 per cent. Angina pectoris is associated with mortality varying from 0 to 33 per cent. Patients with heart block are fair operative risks. Congestive heart failure may be associated with high operative mortality unless corrected preoperatively. Aortic disease due to syphilis increases the operative risk significantly.

These data show that it is difficult to evaluate operative risk in a patient with heart disease. Obvious abnormalities such as status anginosus or the presence of congestive heart failure, myocardial infarct, uncontrolled arrhythmias, and acute myocarditis, all represent poor preoperative risks, but many cardiac abnormalities increase the risk but slightly.

Bundle branch block does not necessarily represent a contraindication to major surgery for cancer. Of 59 such patients studied, only three died as a result of the cardiac disease, a mortality of five per cent, certainly not a prohibitive risk since the patients in a similar age group without heart disease have mortalities of three to five per cent. Moreover, with these same patients it was found that the operation per se did not adversely affect long survival as far as the heart disease was concerned. A patient who survived 19 months or more did so without increasing evidence of heart disease. These patients had major surgery such as gastric resection, pneumonectomy, cholectomy, etc.

Evidence of healed myocardial infarction is not a contraindication to major surgery. Fifty-eight such patients were operated on at Memorial Center with a mortality rate of 5.2 per cent. Fourteen of these patients were alive two or more years after the removal of their cancers, and 16 have survived one or more years, a 51 per cent salvage rate. Knowledge of such a preoperative cardiac status, however, requires meticulous attention preoperatively, during surgery and in the postoperative period.

Fifty-four instances of cardiac arrhythmia developed as an operative or postoperative complication among 28,000 operations. Forty-two per cent of these patients had no evidence of cardiovascular disease preoperatively. The remainder had hypertensive and/or arteriosclerotic heart disease. Abnormal electrocardiograms were found preoperatively in 31 per cent, and an additional 10 per cent had premature contractions. The importance of prompt control of this complication is manifested by the fact that of the 12 patients in whom the arrhythmia persisted, five succumbed to the complication. Prompt administration of digitalis and/or quinidine to patients developing supraventricular tachycardia preoperatively is recommended. If unsuccessful, a trial of procain amide is justified. An additional series of 60 patients with auricular fibrillation adequately controlled preoperatively survived major surgical procedures with a mortality of only four per cent.

Individuals with cancer, like other patients, may be poor risks as the result of pulmonary disease.

Estimations of the ventilatory function can be done very simply with an ordinary gas meter, standardized in cc.'s. The vital capacity and the maximum breathing capacity may be simply obtained with this inexpensive equipment. When the maximum breathing capacity is less than 34 litres per minute, any chest operation is believed to be contraindicated. Other surgery is fraught with great danger. Patients with limitation of pulmonary function due to bronchial asthma, pulmonary emphysema and pulmonary fibrosis do not tolerate infection in the lung. A mild bronchopneumonia may lead to respiratory distress or precipitate heart failure as a result of the associated anoxia.

Renal disease, or at least some suspicion of renal disease, is not uncommon in individuals with gastrointestinal cancer because they have lost fluid and electrolytes from vomiting or diarrhea. Such patients may have urea nitrogens of 70 or 80 milligrams per cent, correctable by the proper administration of fluids and electrolytes preoperatively. On the other hand, a patient without any serious preoperative symptoms having a blood urea nitrogen of 33 or more, a fixed specific gravity of the urine, a PSP excretion of 20 per cent or less, and a urea clearance of 30 per cent or less, must be considered a very hazardous postoperative risk. Patients with acute glomerulonephritis or the nephrotic syndrome do not tolerate surgery well, frequently going into irreversible oliguria postoperatively.

Patients with pulmonary carcinoma frequently have infection consequent to their disease, and therefore the preoperative use of antibiotics is warranted in such individuals. Indeed it is a good plan to administer prophylactic penicillin 24 to 48 hours preoperatively to patients undergoing major surgery.

The type of anesthesia per se is less important than the skill of the individual who administers it. If an adequate airway and blood pressure are maintained, and a careful check of vital signs is made frequently, the choice of anesthetic agent is not of major importance. During the operative procedure, blood losses should be replaced; crises should be promptly managed, chiefly the cardiovascular variety associated with fall in blood pressure, arrhythmia, or the development of cyanosis. I think it is important to urge that we use less and less opiates for pre-anesthetic medication. These drugs may depress the cough reflex and the ciliary action for an undetermined period of time and be responsible for the development of atelectasis or bronchopneumonia.

In a group of patients 70 years or older, who had various types of anesthesia, the mortality rate and the postoperative complications did not vary significantly whether the patient was given spinal, pentotal, or inhalation anesthesia. All of these patients had major surgical procedures for cancer. In the postoperative period, the combination of atelectasis, bronchopneumonia and heart failure accounted for the highest percentage of operative deaths in the 161 elderly patients we have studied who were subjected to major surgery. Care in pre-anesthetic medication, frequent tracheal aspirations, the intelligent use of antibiotics and cardiotonic drugs, with prompt attention to fluid and electrolyte imbalance and surgical complications, played a major part in the survival of these patients.

Elderly patients survive surgery surprisingly well, as indicated by the results of 188 operations in 161 patients, 70 years or older. Of these individuals, 20 died (12.4 per cent). Thirty-one had complications. The end results seemed to justify the surgery, and 75 are living and well, six months to three years later, although 66 have succumbed to their cancer or to intercurrent disease. Various operations are associated with increased operative risks, for example, a 28 per cent mortality for gastric resections as compared to 12.2 per cent for colon resections.

An infrequently emphasized fatal complication encountered in these patients seems worthy of discussion. Six per cent of the patients dying did so from cerebral vascular accidents. It is well known that individuals who had evidence of arteriosclerotic disease of the brain are prone to develop further brain damage following a major surgical procedure. Two of these six patients had such a history. Another two had very definite evidence of senility. When these abnormalities are defined preoperatively, we believe that nothing but the most emergent surgery should be performed.

Postoperative management must be mentioned briefly, and a few high lights should be considered. Certainly the proper use of antibiotics and adequate nursing are essential. Most important of all is to have a physiological explanation or a curiosity to explain any sudden rise in temperature, change in pulse, blood pressure, or respiratory rate, or alteration in the urinary output; much less important is the care of the wound itself. In no other field is the co-operation of surgeons, internists and other consultants more richly rewarded than in the care of the patient subjected to major surgery. The problems encountered demand the combined skill of a trained team.

It might be well to consider the patient who has been doing well, but is unable to take fluids or food by mouth, and may or may not be receiving parenteral fluids. The sudden appearance of marked weakness, listlessness, tachycardia and dry skin would suggest hypochloremic, hypokalemic alkalosis. The electrocardiogram in the undigitalized patient will help to clarify the diagnosis, because

prolongations of the QRS and the QT interval are the rule. Other changes that are characteristic are depression of the ST intervals and variation in the size and shape of the T waves from those observed preoperatively. When blood sodium and potassium levels are determined, the sodium is usually normal with the potassium being three milliequivalents or less. The chlorides are 90 meq. or less and the CO_2 60-90 volume per cent, and the blood urea above 30 mg. per cent. Such patients respond dramatically to the administration of 60 to 200 milliequivalents of potassium chloride intravenously. The patient who couldn't lift a finger in the morning may be sitting up in the afternoon reading his daily newspaper and expressing a desire for food. Many of the unexplained deaths in the past, when the operation was a success but the patient died, were due to this complication.

Many patients with cancer cannot take food and fluids postoperatively. Daily measurements of the urea nitrogen, chlorides, CO_2, hematocrit and proteins should be taken so that electrolyte balance can be maintained. It is desirable to keep the fluid intake at or near 1000 to 1500 cc. of fluid over and above the measureable output. The type of electrolytes given will depend upon their concentration in the blood, but, unless a patient has renal dysfunction, 20-60 meq. of potassium chloride should be added to each daily infusion since this much is excreted by the kidney each day when it is unable to conserve potassium.

Many patients with cancer of the gastrointestinal tract are unable to take adequate nourishment orally and become definite nutritional problems. In such instances, 1500 to 2000 calories may be given by vein in the form of glucose or protein hydrolysates. It is to be hoped that parenteral preparations of fat will soon be available so that even larger caloric intake can be given by vein. Vitamin B Complex and Vitamins C, D, and K can be given intravenously or intramuscularly, to prevent and correct any deficiencies. Too little use is made of intubation for maintaining food and fluid requirements. When patients are unable to take adequate nourishment by mouth, a tube should be passed through the stomach into the duodenum so that formula feedings, water and electrolytes, as desired, may be given both pre- and postoperatively.

Patients with cancer are much more likely to develop thrombophlebitis with its dreaded sequel of pulmonary infarction, and unless these patients are carefully examined every day this complication may be undetected. Prompt administration of heparin and/or dicumarol is the treatment of choice for thrombophlebitis or phlebothrombosis, being maintained for 7 to 14 days, or until the phlebitis has subsided.

Early ambulation is desirable, not so much as an aid in preventing thrombophlebitis but more for its beneficial effects in preventing pulmonary complications, promoting return to normal of gastrointestinal function and shortening the hospital stay.

Our methods for estimating operative risk are obviously crude as yet, and emphasize the need for detailed studies of clinical data if we are to understand what the stress of surgery may represent, so that we can devise improved methods of determining the operative risk.

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Pregnancy Complicated by Spina Bifida, Neurological Bladder and Pyelonephrosis

Edward X. Crowley, M.D.*

Wichita, Kansas

Every obstetrician at some time in his career has been confronted with an unique problem regarding pregnancy and its management, a situation so unusual that his colleagues can speak with no experience, and textbooks can contribute little to ease his doubtful mind. It is at such times that a review of the literature reveals the true, though often underestimated, value of conscientious case reports of rare conditions. The following observations, brief review of previous cases reported, and the addition of one more case, in detail, have been submitted with the hope that it may enhance our knowledge in the handling of rare obstetrical problems.

Spina bifida, the most common anomaly of the spinal canal, is reported by Sutherland, after studying 12,000 x-rays of the spine, to be present in approximately five per cent of the populace. The fifth lumbar and first sacral vertebrae are most commonly involved, with the first cervical next in order, and the remaining vertebrae at random with a rare defect in the thoracic area. Spina bifida cystica, however, which includes all cases with external masses as well as bony defects, and which is of more clinical importance, is reported as having an incidence of approximately one in every 1000 newborns. The survival rate of these is low, a fortunate (or perhaps unfortunate) few living beyond the first year.

Spina bifida is the result of incomplete fusion of one or more laminae of the vertebral column, with or without extrusion of the spinal cord or its membranes. Spina bifida occulta is usually, though by no means always, seen without any signs or symptoms except a small dimple or soft flat mass at the lower end of the spine, the diagnosis being confirmed by x-ray. This group constitutes by far the greater part of the five per cent incidence reported above.

Spina bifida cystica has three types: 1. meningocele, with herniation of the dura and arachnoid through the vertebral defect, 2. meningo myelocele, in which the spinal cord and nerve roots are part of the meningeal sac, and 3. myelocele, also including cord and nerve root elements, in which the defect involves not just one to three vertebrae, as in the other two types, but nearly the whole spine, with no protruding mass but an inflamed vascular neural strip along the mid-line with spinal fluid immediately beneath. Meningomyelocele is the most common of the three and, together with myelocele, comprises the most serious anomalies with extensive disability.

Associated deformities include hydrocephalus (which is probably not directly related but due to a second separate developmental defect); club foot, especially of the double equino varus type; abnormal curvatures of the spine; less commonly hare lip, cleft palate, cerebral meningocele and encephalocele, hypospadias, syndactylia, strabismus.

Related anomalies of the nervous system are varied. Paralysis is relatively frequent with meningomyelocele, less common with meningocele, and unusual in spina bifida occulta. In this last type, even when present, paralysis is much less extensive than with external tumors. There may be weakness or paralysis of the lower extremities, atrophy and weakness of the buttocks or calf muscles, loss of tendon reflexes, especially ankle jerks, trophic ulcers of the perineum or feet, and anesthesia over the perineum, ankles and feet. Weakness of the musculature of the pelvic floor may lead to prolapse of the uterus at puberty. Relaxation of urinary and rectal spincters is seen with prolapse of the rectal wall. Incontinence without other nervous manifestations may be present, but must be distinguished from common nocturnal enuresis or rarer functional diurnal incontinence.

Neurological bladder, sometimes referred to as "cord bladder," associated with spina bifida of the occult or external variety, is due to defective bladder innervation. Bladder sensation arises principally from the second, third and fourth sacral roots, hence its involvement in certain types of spina bifida is understood. The incidence is debatable, but in one series of 23 patients with spina bifida and enuresis reported from the Harriet Lane Home (Johns Hopkins University), four were proven to have definite neurological bladders, 17 were functional and responded eventually to treatment, and in two the exact nature of the bladder disability was not determined. Other series reported do not differ widely from the above ratio. There may be difficulty in emptying the bladder, residual urine, or complete retention with or without overflow incontinence. These symptoms are due to impaired detrusor function of the bladder. With relaxed vesical sphincter, there is continuous dribbling in a bladder of small capacity with no residual urine.

In those cases with complete retention of urine

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from detrusor paralysis or sphincter spasm, there are several dangers. Ascending urinary tract infection is of paramount importance, the most common infecting organism being the colon bacillus, but staphylococcus, streptococcus and bacillus pyocyaneus, singly or in combination, may be present. The symptom complex is a familiar one, varying in severity and the number of recurrences—the subjective picture not necessarily corresponding to the extent of actual findings on microscopic urine examination. Then, too, the degree of sensitivity to drugs of the same type organism in the same patient may vary widely at different intervals. Chills, fever, malaise, anorexia, convulsions (in infancy), and pyuria are often seen. Albuminuria becomes fairly consistent and hematuria appears.

A second development with a poor prognosis for the future is the gradual appearance of dilated ureters and bilateral hydronephrosis. As the calyces become distended, progressive loss of functioning kidney substance occurs. Renal insufficiency ensues, x-ray studies and kidney function tests giving some estimate of the extent of damage done, with coexistent azotemia, acidosis and hypertension. The life span of the individual is thus gravely shortened.

Review of Published Cases

From these observations concerning spina bifida and its crippling sequelae in those few who survive, it is most remarkable that a certain number of newborn girls progress through adolescence, grow to maturity, marry and conceive. According to Slater and Russell of the California Hospital in a recent excellent study and review of the literature, during the past 60 years there were published only five cases concerning pregnancy management in patients with spina bifida. Their added case was the sixth. The following cases, cited by Slater and Russell, are presented with significant factors summarized.

Gilles referred to two cases reported some years previously. His own case, with a lumbar myelocystocele, had a successful spinal operation at age 12. Pregnant for the first time at age 29, she was delivered at eight months gestation of a normal living child by manual dilatation of the cervix and forceps application under chloroform anesthesia. The prenatal course was uneventful except for vomiting. Spontaneous premature labor, lasting some 23 hours with subjective pain, was ended when insufficient dilatation persisted and fetal distress became evident.

Rizzicasa's case was a primipara, age 30, with a generally contracted pelvis who went into spontaneous labor at term. A difficult forceps delivery was done when fetal distress developed, with death of the infant and an injury to the maternal symphysis. Three years later a successful spontaneous delivery occurred. X-ray studies showed a spina bifida occulta and abnormalities of the ischium and pubic bone.

Liepelt, in 1936, reported the case of a 28-year-old primipara, unmarried. She had had no weakness of her lower extremities until the age of 12, after which gradual paralysis developed. Bladder difficulties had been present for only the last six years. Some eight hours of effective but painless labor were followed by spontaneous delivery of an essentially normal infant.

Slater and Russell's case in 1950, like Liepelt's, had paralysis of the lower extremities. There was a spina bifida of L 4 and 5 and a meningomyclocele, double kidney pelvis and ureter on one side, and a bladder diverticulum. An unsuccessful bladder operation was done four years previously because of urinary incontinence. Bowel control was also lacking. The spine and pelvis were markedly deformed. During pregnancy toxic symptoms developed which progressed in spite of careful management. She was delivered of a healthy infant at approximately 37 weeks by a low cervical cesarian section, and her postoperative course was satisfactory.

Our Case Report

E. L., age 24, white married female, presented herself at our office on April 23, 1951, when she was six weeks pregnant. A most attractive girl with an excellent figure, walking with a barely noticeable limp, she discussed her condition with unusual intelligence and understanding. Past history immediately revealed some unique features. Foremost was the fact that she had not urinated in 24 years. She was born with a marked spina bifida, extreme weakness of both lower extremities, bilateral club feet, and paralysis of the bladder. There being no hydrocephalus or complete paralysis of the lower extremities, the meningo-myelocele (for such it was) was operated upon 11 hours after birth.

By the age of seven, after some years of muscle training and two operations on her club foot, she was able to walk with average stability. By the age of nine, she was trained meticulously to catheterize herself two or three times daily, which she has done ever since. Her breasts and genitalia developed normally at the expected age; her menses began at age 13 with a 23-day cycle, lasting five days. Married at age 24, she became pregnant three months later. Her last menstrual period was February 28, 1951, and her expected date of confinement was December 5, 1951.

Physical examination revealed no gross abnormalities except a well healed scar 11 x 4 cm. over the lumbo-sacral area, with excellent fascial closure and support and a barely palpable bony defect over

the lower lumbar and first two sacral vertebrae. The R. lower extremity revealed slight atrophy of all muscles, and both feet showed the surgical scars (with good results) of bilateral equino varus club foot. Pelvic measurements were within normal in all diameters.

Pelvic examination revealed a normal early pregnancy. The urethra showed no evidence of trauma. Red blood count was 4,400,000, hemoglobin 84 per cent, Rh positive and Wassermann negative. Urine was negative for sugar with a trace of albumin, microscopic urine 10-15 wbc per HPF, no RBC. Inasmuch as the patient had had repeated but never severe bouts of pyuria throughout the years, and knew well the use and dosage of urinary antiseptics, antibiotics and the limitations of sulfonamides, it was decided to treat these recurrences in the way that had previously given excellent results. Her episodes of pyuria had averaged one or two per month, which incidence continued through the first six months of pregnancy. Her careful method of self-catheterization was also continued, averaging two or three times in 24 hours.

She was placed on restricted salt intake, and dietary measures according to Tompkins' regime and weight gain limitations were explained. Combined calcium and vitamin therapy was ordered, as well as phenobarbital grs. ss t. i. d., the latter as palliation for an understandable nervous reaction.

The following resume, with some omissions, will perhaps most clearly explain her prenatal course and subsequent developments.

4-23-51—Weight 126; blood pressure 122/80; urine, trace albumen, sugar negative, 5-10 wbc per HPF. Six weeks pregnant. Slight nausea and vomiting.

5-21-51—Weight 127; blood pressure 120/84; urine negative. One episode burning and urgency of bladder during month. Slight fever. Treatment, terramycin.

6-18-51—Weight 126; blood pressure 140/82; urine negative. Two bouts of chills and fever during month, responded to terramycin.

7-17-51—Weight 130½; blood pressure 132/86, urine, one plus albumen. Slight urinary distress two or three times. No treatment needed. One episode post-coital spotting. Fetal movement June 30.

8-14-51—Weight 134½; blood pressure 130/80; urine negative. Uterus enlarging normally. No distress.

9-6-51—Weight 137½; blood pressure 150/102; urine, one plus albumen. 40-50 wbc per HPF, two plus bacteria. Two episodes pyuria during three weeks. Treated with gantrisin. No headache, dizziness. Feels well.

9-15-51—Weight 140½; blood pressure 158/118; urine, three plus albumen; wbc, numerous in clumps, bacteria four plus. Temperature 100.4. No edema. *Admitted to Wesley Hospital, 29 weeks pregnant, pyelocystitis* and *preeclamptic.* Bed rest, morphine, hypertonic glucose. Improved in four days. Urology and x-ray consultation deemed advisable. Intravenous pyelograms showed diminished kidney function with marked bilateral hydronephrosis. PSP test, 45 per cent in two hours. Blood urea N. was 11, urine culture E. Coli, sensitive to terramycin and chloromycetin only.

9-26-51—Blood pressure 140/96; urine 10-15 wbc.

9-29-51—Urine, numerous wbc, many rbc, albumen three plus, bacteria four plus. Treatment, chloromycetin.

10-5-51—Uterus 23 cm.; blood pressure 160/104, albumin two plus; weight 141¾.

10-13-51—Blood pressure 156/114, slight headache.

10-20-51—Uterus 26.5 cm.; blood pressure 112/90; albumen one plus.

10-27-51—Blood pressure 150/118; urine, albumen three plus, bacteria two plus. Decision to deliver at eight months or sooner if necessary.

11-3-51—Blood pressure 150/118, 35 weeks pregnant. Closed thick cervix. Floating head. Low *transverse cervical cesarean section.* Sodium pentothal induction, cyclopropane. Living male, 4 pounds and 12 ounces, normal, vigorous. Prophylactic chloromycetin.

11-7-51—Postoperative course good until today. Severe right pyelitis with extreme pain. Blood pressure 170/120. Cystoscopic with right ureteral catheter inserted. Uric acid 3.7. Blood urea N. 13, CO_2 67 volume per cent. Urine culture, E. Coli and Pseudomonas aeroginosa (former sensitive to terramycin only, latter to streptomycin only). So treated.

11-7-51—X-ray: spina bifida of fifth lumbar segment with no apparent development of posterior spinous process and a large posterior defect in S 1 and 2. There is a slight list of the spine to the right.

11-13-51—Home, much improved. Mendelamine during alternate 10-day periods.

11-24-51—Three weeks postpartum. Scar healed. No urinary distress. Blood pressure 164/102; urine 150-200 wbc, albumen one plus, Sp. gr. 1.014, PH 5.0.

12-14-51—Six weeks postpartum. Pelvic, normal involuted uterus. Scar healed with keloid. Blood pressure 138/98; weight 127; urine, 1.012, PH 6.0, albumen trace, 5.7 wbc, bacteria three plus, occ. epith. Feels perfectly well. Baby gaining normally.

Discussion

1. The courageous decision of this patient to

chance a pregnancy, knowing quite well both the potential hazards to herself and the possibility of delivering an abnormal child, made us most conscious of the viability and survival of her infant Both the toxemia and urinary tract infection appeared ominous, but in the absence of severe headache, dizziness, visual and gastro intestinal symptoms, the decision was made to wait if possible until eight months gestation. No definite advantage was evident in waiting longer; perhaps even then some irreversible kidney or vascular damage had occurred. The end result, in retrospect, seems to have justified our decision.

2. The patient's description of "burning in the bladder" and urgency in an anatomically non-functioning and supposedly insensitive bladder, seems paradoxical, but in every instance her urine revealed excessive WBC accumulation as well as bacteria. Prior to and in early pregnancy her clinical response to small doses of sulfonamides and as little as 250 mgms. of terramycin t. i. d. for two days, is difficult to explain, when massive doses of chloromycetin, streptomycin and gantrisin were necessary during the third trimester, for certainly the pyuria and pyonephrosis were of long standing. Therapy was based upon urine culture and drug sensitivity tests, so poor choice of therapy was not the factor.

3. Our mode of delivery, cesarean section, seemed only logical with an unengaged vertex and an uneffaced, undilated cervix. The possibility of hyaline membrane disease, adsorption atelectasis, and pneumonia in a premature born by cesarean section was considered, but was too remote to change our decision. Even with a "ripe" cervix and full engagement, the thought of some of the problems of labor and delivery reviewed above, as well as other unpredictable complications, would have discouraged us from attempting induction and vaginal delivery.

The future for this patient is uncertain, for there is definite renal damage, undoubtedly aggravated by this pregnancy. A subsequent pregnancy would probably end in tragedy, but for the present she is an extremely happy and grateful patient.

Summary

Some salient features concerning spina bifida, its definition, description, incidence, and associated deformities are discussed. Co-existent bladder and kidney disability, with origin and symptomatology, is considered. Six previously published cases of spina bifida complicating pregnancy are briefly reviewed. Our own case, further complicated by neurological bladder and bilateral pyelonephrosis, is submitted in some detail.

The author wishes to express his appreciation to his associate, Dr. George E. Cowles; to Dr. Harold F. O'Donnell, urologist; Dr. Newman C. Nash, radiologist, and Dr. Bert E. Stofer, pathologist, for their invaluable assistance.

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Minimum Standards of Obstetrical Care*

Committee on Maternal Welfare**
Kansas Medical Society

Introduction

In 1941, the Committee on Maternal Welfare prepared a pamphlet setting forth certain minimum standards for obstetrical care. This was an attempt to improve the general level of obstetrical care in the state of Kansas by establishing certain diagnostic and therapeutic requirements which all physicians could reasonably be expected to meet.

The present committee has sought to revise this pamphlet in order to keep abreast of those changes in obstetrical management which have developed in the past few years. It is not intended to be a set of directions, nor is it intended to be dictatorial. It is not intended to be exhaustive. There are numerous points of controversy in obstetrical care. There are many other important points upon which there is general agreement, and these points make up what we believe to be the minimum standards for obstetrical care.

One of the functions of the committee is the annual review of cases of maternal mortality. These cases are critically examined according to the information presented, and an attempt is made to assign the responsibility in each case. This particular study gives the members of the committee the opportunity to remind themselves that the loss of a mother rarely develops from any unusual or bizarre complication. In the majority of cases, the abnormality which leads ultimately to the death of the mother originates as a small deviation from a simple and well-known warning, ignored or discounted until an irreversible state develops. The committee feels justified, therefore, in taking every possible opportunity to remind those practicing obstetrics of the considerable responsibility they have assumed.

The normality of obstetrics is its most dangerous feature. It demands that the physician be constantly on the alert. There is a general impression that bearing a child is only a little more difficult than any other excretory process, and the physician's primary purpose is to bestow a benign pat on the head, sign the birth certificate and help with the clean-up period. Mother Nature does a remarkably fine job, but it was not through her efforts alone that the maternal mortality rate in the United States has been brought to less than one in 1,000 births. Rather it has been a combination of lay and professional education and the alert and rational application of expanding diagnostic and therapeutic measures. The development of these measures is so much a part of our way of the practice of medicine that we often fail to appreciate how important many of them are.

The points which the committee wishes to stress have been set up in chronologic sequence. The pregnant woman is the subject of a dynamic process. The events of her pregnancy and the possible complications must be considered as interrelated problems rather than as a group of isolated and independent circumstances. The opinions contained herein represent not the only possible opinions, nor necessarily the unanimous opinions of the members of the committee, but rather an attempt at a reasonable and proper handling of such problems applicable in any place or condition of practice.

Prenatal Care

One of the most gratifying results of health education has been the earlier arrival of the pregnant woman at the physician's office. Good prenatal care has resulted from patients seeking it, and patients have sought it because the medical and lay press have stressed the value of close supervision of the woman during pregnancy.

Most laymen and many physicians, however, still consider the act of delivery the only phase of obstetrical care requiring any knowledge or aptitude. Good prenatal care requires much more. It is, unfortunately, not uncommon to hear a multipara, after the completion of a general examination, remark that it is the first time she has had a complete examination with any of her pregnancies. If this patient has had only a cursory physical examination in the past, it seems reasonable to assume that any medical history taken on the occasion of her earlier pregnancies must have been equally cursory. It is just as reasonable to assume, therefore, that that patient has not had adequate medical care. The fact that a mother and infant may survive the pregnancy and delivery is not necessarily a commendation of the attendant, but perhaps a tribute to natural forces. *The first requirement of good obstetrical care is that the patient have a thorough physical*

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examination and medical history as early in her pregnancy as feasible.

Medical History. The medical history of a pregnant woman need not be different from that of any other patient, except for amplification of those features relative to her endocrine function and child bearing. It includes the usual elements of family background and past medical experiences. Especially there must be emphasis upon any previous pregnancy episodes and some inquiry into the menstrual pattern. Although there will be no obstetrical incidents in the case of a primigravida, the history-taking gives the physician the opportunity to derive some information about the patient's personality and background. It helps to establish a certain amount of rapport and dispel some of the tension which is a constant accompaniment of the patient's first visit to the physician.

In the case of a multigravida, such details as she may recall of her earlier pregnancies may be invaluable. The history of several normal pregnancies is reassuring, but certainly the absence of abnormalities does not preclude the possibility of such developing in the future. In this connection, it is well for a patient to be given simple common sense explanations of any significant events and activities in the course of her pregnancy and delivery, so that she may transmit these as accurately as possible to any subsequent medical consultant. (This might help to offset the amazement the physician sometimes feels when a patient describes some apparently inexplicable course of management followed by a previous physician). The ease with which women get their medical information garbled is equaled only by the ease with which they will accept unnecessary surgical procedures on their pelvic organs.

Those things which are of specific interest in obstetrical patients, then, are the number and course of previous pregnancies, the size and the state of maturity of the infants and any abnormality of the postpartum period. At one time, the history of the use of forceps indicated an abnormal course of labor. Now with the growing use of elective outlet forceps, the history of the use of forceps must be evaluated more carefully in determining abnormality.

If the physician is not acquainted with the patient's social and economic background, he should make that acquaintance in the process of taking the history. Thus he learns a little about how well his instructions may be followed and how to present them so the patient will be adequately impressed. He may find certain domestic factors which will explain symptoms of a psychosomatic nature. The patient's attitude toward her pregnancy, her husband, children or other members of the family is of considerable importance. Specific questioning is essential but, as with any history-taking, the most important information may come spontaneously by allowing the patient to talk out her problems. Some mothers, especially primiparae, may be dewy-eyed and lyrical about pregnancy. Others, especially multiparae, may be in the throes of a serious problem of adjustment to the social, economic and domestic complications of an unexpected (if not unwanted) pregnancy. The latter need the physician's help more than the former.

Physical Examination. The physical examination should be basically a thorough general examination with certain specific investigations of interest in relation to the pregnancy. Particularly some form of pelvic mensuration should be carried out. The exact technique of this particular study is less important than the fact that the physician use some method with which he is familiar so that he has a working knowledge of the patient's pelvic capacity. X-ray pelvimetry is helpful in suspected pelvic contractions but can be delayed until the alterations attendant to pregnancy are fairly well established and the infant is of sufficient size that some significant comparison of the presenting part to the pelvic canal can be made. Clinical judgment is still the most important factor in evaluation of the pelvis.

It is desirable to refer the patient to her dentist for adequate care during her pregnancy.

Laboratory Procedures. The minimum laboratory work which should be carried out on the initial visit includes a serological test for syphilis, examination for the Rh factor, a blood count—at least a hemoglobin determination—and urinalysis. (It may be well to do elective blood typing at this time if emergency blood typing cannot be readily obtained). The significance of the serological test is obvious. The chief value of the Rh factor determination lies in its warning of possible complication in some cases, albeit a small number. The physician who is confronted with an erythroblastotic infant without being previously warned by available laboratory procedures has not performed his full duty to the patient. Blood counts with particular emphasis on the hemoglobin should be considered in relation to the patient's period of pregnancy, physiologic hydremia and potential blood loss at delivery. It is wise to check the hemoglobin not only in early pregnancy but within a few weeks of term. Obviously any low readings will call for appropriate measures and future checks. Urinalysis should include specific gravity, pH determination, tests for the presence of albumin and sugar and microscopic examination. The urinalysis at any one time is less significant than repeated regular examinations. The first specimen voided in the morning should be the one tested, and the patient should be warned to

cleanse herself in order to avoid contamination of the specimen by vaginal discharge.

Routine x-rays of the chest are a desirable practice but may not be practical in many situations.

Dietary Instruction. The patient in early pregnancy should be given certain basic instructions. The most important of these pertains to diet. Individuals below normal weight must be urged to add enough to their intakes to bring their weights up accordingly, whereas the overweight must be discouraged from eating more than basic requirements in order to hold down to a reasonable gain. The patient usually considers dietary restrictions to be in the interests of developing a smaller baby, and it should be stressed that the important factor is her own metabolic problem.

During pregnancy and lactation the nutritional requirements of women are increased considerably. In recent years, many studies have indicated that the prenatal diet affects fetal growth and development as well as the course of pregnancy, labor, delivery and the postpartum period. There is conclusive evidence that the incidence of prematurity, stillbirths, toxemia and congenital defects is markedly higher among infants born to mothers whose diets were inadequate than among those of well-nourished women.

The recommended allowances for protein, minerals and vitamins are increased during pregnancy but in the first months of pregnancy caloric requirements remain the same as for the nonpregnant woman of moderate activity. During the last half of pregnancy, the caloric needs increase approximately 20 per cent unless weight restriction is indicated. The normal diet should include the following minimum quantities of the Basic Seven food groups daily: one quart of whole pasteurized milk; one to two servings of meat, fish, poultry, or meat alternate; one egg; three servings of vegetables (one green or yellow, one potato); two servings of fruit (one citrus); three servings of whole grain or enriched bread or cereal; and two tablespoons fortified margarine or butter.

During pregnancy and lactation some form of vitamin D should be supplied which provides each mother with at least 400 units of vitamin D daily. During lactation milk should be increased to one and one-half quarts each day; a serving of green or yellow vegetables and a serving of citrus fruit should be added to the above daily requirements. The basic dietary pattern outlined above is adequate for mothers who enter pregnancy in a well-nourished state. For those who are chronically malnourished or undernourished, additional quantities of these foods will be needed.

Prenatal Visits. The patient should be instructed to return at least every four weeks for follow-up examinations which must include blood pressure, weight determination and urinalysis. The frequency of visits should be increased as term approaches since changes in the patient's condition may occur more rapidly.

In order to allay anxiety, an explanation of the progress the patient is making and preparation for labor and delivery should be accomplished during these visits. Symptoms and signs of complications are presented to encourage the reporting of such as early as possible. Discomforts of physiologic origin are diminished by logical explanation. The patient's attitude toward her pregnancy, labor and delivery are considerably affected by the contact she establishes with her physician during these visits. He provides a figure of security which can be occupied by no other person.

Breast Feeding. Part of the patient's orientation to pregnancy and motherhood should be an enumeration of the advantages of breast feeding. The physician soon finds that his remarks meet with responses varying from enthusiastic approval to frank rejection. Those mothers who sincerely want to nurse their babies will usually be successful with no more than casual support from their physician. He will probably not accomplish much with those who have decided against it, for they consciously or unconsciously interpose obstructions until a hopeless situation occurs. The patients for whom he can do most are those who are mildly favorable or even doubtful, but who need encouragement or persuasion. The success of breast feeding cannot be foretold; the multiple factors involved—home situation and emotional stability, the basic productive apparatus and metabolic state of the patient, the attitude of her family and physician, the sucking vigor of the baby, previous success or failure at nursing, and so on—mean that a good trial is the only way to determine how well a mother can nurse. The physician who expends a little more time and energy helping to establish a mother and baby on breast feeding will probably save more time and energy in subsequent months by eliminating many feeding problems and enteric infections.

Complications of Early Pregnancy

Nausea and Vomiting. The majority of patients in early pregnancy experience some degree of gastrointestinal discomfort. This may be a mild and short-termed nausea, a more persistent and annoying nausea without vomiting, nausea with moderate vomiting or protracted vomiting, which can be classified as hyperemesis gravidarum. Vomiting by the average patient is controllable if she can be persuaded to eat small amounts of food frequently.

Mild sedation through the day may be of benefit. Vomiting can often be brought under control with vitamin B complex augmented by pyridoxine hydrochloride. Once the vomiting cycle is broken, sedation and persistent food intake may be utilized to keep the patient under control. The psychogenic factors in this particular problem are obvious, but it is neither right nor reasonable simply to dismiss the patient as "another neurotic female." Encouraging the patient to approach her problem realistically will do much more than brow beating her and attempting to make therapy unpleasant enough to drive her away from her symptoms.

While nausea and vomiting in most patients are annoying and temporarily distressing, they usually do not create an abnormal metabolic state. When the vomiting becomes so severe as to definitely alter the organism, specific corrective measures must be taken. The patient who is vomiting constantly and shows an elevation of temperature and a pulse rate of 100 or over, or ketonuria, can be considered a true case of hyperemesis gravidarum, in need of immediate attention. Such a patient should be treated by deep and prolonged sedation and intravenous fluids (protein hydrolysate, saline and glucose) until the vomiting cycle is interrupted. Isolation from the family in a darkened room and firm but considerate attention are essential. A Levine tube in the stomach with constant suction will stop the vomiting when other measures fail.

Bleeding. *Any bleeding that occurs after a pregnancy is established is worthy of investigation without delay.* The character of the initial episode of bleeding may give definite evidence as to its etiology and significance. Too many patients have the idea that it is possible to menstruate regularly during pregnancy. The patient's interpretation of quantity cannot be relied upon. One person will report a hemorrhage which in actuality consists of a scant flow, and the next patient will report a slight flow which turns out to be a serious amount of bleeding. Many patients will say nothing until a week or so has passed, or at least until the family washing and floor scrubbing are done.

The first and most important treatment is bed rest. Mild sedation is of some benefit here, not so much as a means of quieting the bleeding as making the patient more amenable to red rest, since she usually feels no particular inclination to keep herself quiet. Thyroid substance and any one of several schedules of estrogen and progesterone therapy may be utilized. It is not within the scope of this publication to set forth such a schedule. It is to be emphasized that bed rest and sedation are the most important features of management. Bed rest should be continued until no bleeding has occurred for three days. If the patient becomes active sooner than this, there is likelihood that the bleeding will recur; if she gives herself the benefit of this much rest, the likelihood of her having repeated bouts of bleeding is much reduced.

When the degree of bleeding is suggestive of more than a threatening abortion, it is sometimes advisable to insert a sterile speculum into the vagina under aseptic conditions. This can be done gently, and the exposed cervix may tell the physician whether it is worth while to continue conservative management or if it would be better to assist in the evacuation of the uterus. The problem is the determination of the point of transition from a threatening abortion to an inevitable one.

The condition remains in the threatening class until some pregnancy tissue has been expelled, indicating that continuation of the pregnancy is impossible, or until the bleeding becomes of such a degree that intervention is demanded for the safety of the patient. Here, as in any case of bleeding, avoidance of excessive blood loss is important, and the physician must foresee and forestall obvious dangers by having the patient's blood typed and arranging for blood to be available at a moment's notice. Consultation should be utilized freely in such cases.

Pain. Pain related to bleeding in early pregnancy may be helpful in diagnosis. Most patients will recognize the crampy character of pain associated with abortion, comparing it to menstrual cramps or labor pains. A steadier, sharper, more severe pain is that of a rupturing ectopic pregnancy. In this case, the external bleeding is usually less than in abortion. This may be misleading as to the severity of the condition, for internal bleeding may be of a dangerous degree and, as a matter of fact, the sudden onset of shock may be the first indication of trouble. The history of a missed menstrual period and severe abdominal pain should point to ectopic pregnancy until it is positively excluded (surgically if necessary). Diagnostic signs such as Cullen's sign and blood in the cul-de-sac are helpful, but their absence does not eliminate the possibility of this condition.

Complications of Late Pregnancy

The latter part of pregnancy presents factors which are productive of specific complications. The patient must be more closely and frequently scrutinized than in early pregnancy.

Postural Complaints. Complaints relating to structural stress are much more common because of the fact that the uterus is now an abdominal organ and its rate of growth is much greater. Simple back ache from fatigue is frequent, particularly in multiparas, the lumbosacral and sacroiliac areas being the commonest sites. Well fitting and properly adjusted

maternity supports make life much pleasanter for those individuals who are particularly uncomfortable from such structural problems. The routine use of such garments is probably not necessary since most patients will not accept the discomfort of the garment itself unless it promises relief from greater discomfort which would come from not wearing it.

Varicose veins can be annoying or disabling. Their management graduates from simple postural instructions, through counter-pressure measures in the form of elastic bandages or stockings, to surgical correction which may sometimes be necessary.

The common denominator in both of these conditions is the erect posture which man has so proudly assumed. Whatever benefits he may have received from this position his wife has paid for many times over with her pelvic and lower extremity distress during pregnancy. The obstetrical patient must be urged during the latter months of pregnancy to spend frequent, if short, periods of time lying down with the legs elevated, or at least placing the legs on a level with her pelvis while sitting. The reason this must be emphasized repeatedly is that it is so simple. If rest and postural change could be taken in pill or shot form, the patients would not object at all. But let the obstetrician recommend rest through the day, from time to time, as an important feature in her welfare, and the patient, particularly if she is a multipara, withers him with that "I-wish-you-had-all-those-kids-and-that-house-to-take-care-of" look.

Distressing as these conditions may be, they have no directly adverse effect upon the fetus and are generally not as important in their effect upon the mother as certain other conditions which may develop in the latter weeks of pregnancy. These may be roughly divided into bleeding and metabolic complications.

Bleeding. When bleeding develops in late pregnancy the primary consideration must, of necessity, be diagnosis. The first point of diagnosis is not the determination of the exact cause of the bleeding but whether that cause is a minor and temporary condition, or whether it warrants immediate action because of its threat to the mother or the child. *The patient must be investigated with the more dangerous conditions in mind, the diagnosis of the lesser conditions being arrived at only by positive exclusion of the more serious ones.*

Serious bleeding in late pregnancy nearly always stems from some degree of separation of the placenta. This separation may be due to the fact that the placenta lies abnormally close to the cervix, and separates as late changes occur in the cervix. It may be due to spontaneous separation of a normally located placenta. The most important procedure at this point is typing of the patient's blood so that transfusions can be performed rapidly in case of need. Bed rest should be immediately instituted. It should be terminated only after the infant has been delivered or at such a time as the physician can completely assure himself that the patient's activity will not cause a recurrence of bleeding, and that the patient and the fetus will not be endangered by such activity.

In late pregnancy, vaginal bleeding, which is sudden in onset and painless, should suggest placenta previa. Diagnosis depends upon determining the position of the placenta in relation to the internal os. The amount of bleeding is not a good criterion. One of the simplest and most helpful aids here is an antero-posterior x-ray picture of the abdomen. This may not show the exact location of the placenta, but it may show that it is not in the lower pole. If it can be demonstrated by x-ray that the placenta is in the lower pole of the uterus, a possibly dangerous pelvic examination may be avoided. If positive diagnosis cannot be made by x-ray, and if the degree of bleeding is considered to be dangerous and demanding of immediate intervention, a pelvic examination may be done, but *only if blood is being given or is immediately available for transfusion, and arrangements have been made for immediate interruption of the pregnancy by cesarean section.* Pelvic examination is aimed only at determining the degree of placenta previa. If the condition is found to be of the complete or central type, there is no alternative but to deliver the patient by cesarean section. If the condition is partial or the placenta is of the low-lying type, the physician must decide for himself what course will be the safest for the mother and the fetus. If the degree of bleeding has been slight and the fetus is not yet viable, there may be some justification for temporizing; but the patient must remain at bed rest where facilities are immediately available for delivery.

If the placenta previa is definitely ruled out, one is suspicious of premature separation of the placenta, but this is almost always accompanied by a certain amount of abdominal pain. The classical picture of the acutely distressed patient and the woody hard uterus leaves little doubt as to diagnosis. A problem is posed when the patient is in relatively good condition and the uterus is contracting only intermittently as in the early stages of abruption. This condition allows less temporizing than painless bleeding. In such a situation, if the fetal heart is still active, the physician must make his diagnosis and decision quickly for there is no way of knowing how soon the separation may become incompatible with fetal life. While emergency cesarean section is usually done in order to save the baby, there may be justification for it even when it is known

that the fetus has probably succumbed. If the cervix is long and hard and the likelihood of expulsion of the pregnancy vaginally is slight, it may be necessary to empty the uterus through the abdominal route in order to control the bleeding.

Rupture of the uterus is a condition which is fortunately uncommon but warrants mention. If abdominal pain and bleeding develop and then pain subsides rather suddenly, or even if an apparently normal labor has started and the pains stop suddenly, the likelihood of rupture of the uterus must be recognized. Usually, this condition produces a profound reaction in the patient which indicates that an intra-abdominal emergency exists. Sometimes, the reaction of the patient may lag behind the actual event, and if there is delay in recognizing that the uterus has ruptured, the mother may be lost.

Rupture of the wall of a normal uterus is rare, but the scar of a previous cesarean section is a common site of tearing. A history of previous section, therefore, warrants added vigilance.

The Toxemias. This publication makes no attempt to set forth any new classification of the toxemic disorders of late pregnancy; there is a multitude of old ones of varying value. However, it will attempt to stress those features which are indicative of impending trouble. The patient is urged from all sides to see her physician regularly, and *the primary purpose of regular and consistent check-ups is to pick up any findings suggestive of impending toxemia at the earliest possible time.* The classic indications—elevated blood pressure, albuminuria and edema—are well known. The physician's primary obligation is to control the course of the patient's pregnancy, as far as possible, in such a way as to avoid the development of toxemia; and, secondly, to direct or restrict the patient's activities in the proper manner if symptoms of toxemia do develop.

The one element of the triad which is most open to individual interpretation is edema. Edema of the legs and feet is so frequent a finding in otherwise normal pregnancy that its development as an abnormality may be overlooked or its significance too greatly minimized. There is little problem of recognition if the feet and legs are grossly involved or if the hands and face are obviously edematous. There may be more difficulty in interpretation if the patient is seen during a period of water retention which brings a rapid gain in weight without gross edema. This emphasizes the point that the external appearance of edema implies that a significant amount of fluid retention has already occurred. Apart from association with toxemia, edema can be productive of considerable general discomfort, and the patient usually feels considerably relieved when this fluid is mobilized and eliminated. It is advisable to restrict the patient's salt intake in the latter part of pregnancy with a view toward keeping fluid retention to a minimum. When fluid retention is apparent, diuretics are in order.

Albuminuria is a relatively late development in that some elevation of blood pressure and obvious fluid retention will usually have occurred prior to the finding of albumin in the urine. Albuminuria generally increases in degree and in proportion to the severity of the other findings and may persist for a considerable time after termination of pregnancy and cessation of other findings. A high protein diet throughout pregnancy has a definite prophylactic effect against toxemias, and protein foods should not be restricted in the presence of albuminuria.

Toxemia in pregnancy is generally classified as pre-eclamptic or eclamptic, although this division is not too accurate since the former term implies that eclampsia is bound to follow in the course of time and events. Similarly, pre-eclampsia has been divided into mild and severe types, though these may not be sharply distinguished from each other. The patient showing any degree of toxemia should be placed upon a regimen proper to that degree, but anticipating increasing severity. Principally, she must be put at rest with adequate sedation to insure the procurement of this rest. The importance of protein in the diet must be emphasized, and salt and salty food eliminated. Diuretics should be prescribed, a reasonable program being two grams of ammonium chloride four times a day for four days, followed by a short rest period and repetition of this course if necessary. Blood pressure and urine examinations must be made frequently enough that the physician can anticipate which direction the condition is going. Mild degrees of toxemia will usually respond to such a course of management; the more severe states require individual therapy. If the fetus is beyond the point of viability and the patient fails to respond within three days to the conservative management outlined above, termination of the pregnancy is usually indicated. Fortunately, labor often starts spontaneously, but if it does not and the patient does not seem a suitable candidate for induction, cesarean section is justified.

The management of eclampsia is directed primarily at controlling the convulsive state with sufficient sedation to keep the patient below the convulsive level. For many years, morphine has been the stand-by for this purpose, but the barbiturates have some advantages because of their anti-convulsant action. Magnesium sulphate is another valuable central nervous system depressant, and its use in conjunction with other sedatives is generally accepted.

If some degree of oliguria exists, fluids should be restricted to anticipated fluid loss, that is, approximately 2,000 ccs. a day. Hypertonic glucose solutions have been utilized for many years because of the belief that the edematous central nervous system might be beneficially dehydrated, and continues to be a common form of therapy.

It is not wise to rush in and attempt termination of the pregnancy until the convulsive state is under control, unless continuation of the pregnancy presents an even greater threat. Fetal survival is then so low that the mother should not be subjected to more irritation than she is already experiencing in an attempt to deliver a doubtful baby. When the patient seems to be under control, the mode of delivery warrants the same consideration as for preeclampsia, with more tendency toward cesarean section providing a living fetus is still present. Termination of the pregnancy does not relieve one of concern and responsibility, for convulsions may continue—in fact, occur initially—as long as 24 hours after delivery.

Management of Labor

Premature Labor. The possibility of the fetus surviving if it is expelled after 28 weeks of gestation increases considerably with each week after this so-called period of viability is reached. The management of any attempt on the part of the uterus to empty itself must take the fetus into consideration. If the patient starts having obvious uterine contractions, the probability of her delivering despite efforts to prevent it increases as term is approached. Early in the period of viability, the physician faced with this problem must base management upon his belief that he can or cannot stop the expulsive process. If the condition of the cervix, position of the fetus and other findings indicate that no significant changes have occurred, sufficient sedation should be administered to stop the contractions. If labor continues despite sedation, or if initial examination indicates that irreversible changes have occurred, sedation should then be withhheld and delivery effected with the least possible analgesia and anesthesia. *Prematurity is less threat to the infant than narcotization.*

Premature Rupture of the Membranes. Occasionally, rupture of the membranes occurs before or as the initial event in labor. This requires immediate checking of the patient, primarily because of the possibility that the cord may prolapse at this time. If prolapse has not occurred, the patient should be kept at bed rest awaiting the onset of labor which, fortunately, usually develops within a matter of hours. If prolapse of the cord has occurred or does occur before the patient is ready for delivery, she must immediately be placed in Trendelenburg position in an effort to avoid compression of the cord. Labor can develop and progress satisfactorily with the patient in this position, and it offers the best hope of saving the infant. There is no virtue in attempting replacement of the cord manually.

The possibility of cord prolapse is one of the strongest deterrents against elective induction of labor with mechanical rupture of the membranes, especially in the presence of a floating or poorly engaged head.

The other complication following premature rupture of the membranes is the increased incidence of uterine infection of the mother and neonatal pneumonia in the infant. The possibility of this development increases, of course, as the time lapse between rupture of the membranes and onset of labor increases. It is advisable to administer penicillin prophylactically while waiting for labor to start.

Conduct of Labor at Term. The proper management of normal labor at term begins with a diagnosis, and at times it may be difficult to know positively whether or not a patient is actually in labor. Once labor is definitely established, the physician is besieged by the patient and family for a positive time schedule, and if he has not learned the fine art of hedging before, he must learn it now. The pelvic measurements and condition of the soft parts, the frequency, length, and amplitude of the contractions, the size and presentation of the fetus, and the emotional status of the patient are factors in determining the rate of progress in labor. The primary responsibility of the physician lies in his attendance on the patient at sufficiently frequent intervals that he can determine, as well as his clinical judgment allows, her status, the condition of the baby and the probable course of future progress. If he is not in constant attendance, someone capable of keeping him accurately informed must be present at all times. He must be available on short notice, and he must keep in mind at all times his moral and legal responsibility for the patient's welfare.

Adequate examination of a patient in labor includes (1) abdominal palpation to determine the presentation of the fetus and the condition of the uterus, (2) auscultation and evaluation of the fetal heart tones, and (3) rectal examination to determine the degree of effacement and dilation of the cervix, station and position of the presenting part and presence of forewaters if any. Blood pressure, pulse rate and temperature should be determined as soon as the patient is admitted to the hospital or when she is first seen at home by the attendant. Any abnormal findings must be followed up. Vaginal examinations should be omitted unless demanded by some abnormality and should be carried out only under aseptic conditions.

Management of labor today must include some consideration of analgesia and anesthesia. The physician who chooses to administer some medication to his patients for relief of pain in labor must accept a certain fetal mortality as a result of this practice. This is meant chiefly as a warning that close attention must be given to the infant born of any mother who has had some sedation, and it may not be as grim as it sounds. It should be pointed out that some infants can probably attribute their survival to the fact that their mothers did have sedation. At any rate, the amount of medication offered to a given patient should be balanced between a reasonable degree of relief for the mother and minimal effect on the baby. There is no way to predict the degree of effect on a given baby except that obviously large doses are going to cause more trouble. The patient's reaction is not always a good criterion. Many will talk coherently and complain bitterly with their contractions, only to report a complete amnesia for the whole affair the next day Generally, the physician will have no trouble keeping sedation to a safe level if the patient has been properly oriented and adjusted to the course and activities of labor.

Deviations of Labor. These remarks have been concerned with labor progressing at a normal rate. Mention was made earlier of the factors that influenced the rate of labor, and the effect of sedation was deliberately omitted until this point. The delaying effect of early medication has been touched upon, but it warrants mention at least that the rate of progress after sedation occasionally increases so markedly that some credit must be given to the general relaxing effect of the drug on the patient. True, the patient may have been on the point of moving rapidly anyway, but it seems to occur a little too often to be entirely coincidental.

Precipitate labor and delivery give the obstetrician little opportunity for control. In fact, his primary problem is to get to the patient. Once there, he must attempt to control the process to avoid undue trauma to the mother and baby. More distressing for the physician is the problem of uterine inertia. Patients in false labor may have reasonably good contractions with no demonstrable result. So long as the physician can assure the patient and family that true labor has not started, he will not be expected to produce results. When the contractions begin to show some effect in the form of cervical effacement and dilation, a diagnosis of true labor may be made. If the contractions are frequent and strong but with very slow response on the part of the cervix, a state of uterine inertia is said to exist. This will surely test the ability of the obstetrician to handle the patient and her family diplomatically. As long as slow but steady progress is made and the patient is maintained in good condition with intravenous fluids (including protein hydrolysates) and adequate periods of rest (with sufficient medication to ensure sound sleep for a few hours), no further intervention is justified. If, however, the patient has had an adequate trial of labor and has failed to dilate sufficiently, further examination (e.g. x-ray pelvimetry) must be performed to rule out some previously unsuspected obstructive mechanism. When the condition of the mother or fetus warrants delivery without delay, cesarean section becomes justified. The use of pituitary extract is to be condemned, except in the hands of those specifically trained in its present-day use.

Induction of Labor. The induction of labor for purposes of convenience cannot be justified. Only those conditions which demand termination of the pregnancy as a measure of welfare for the mother or baby can be considered proper indications. This implies that the continuation of the pregnancy represents a greater threat than does induction and its possible complications. Even then, conditions must be just right for success in starting labor, i.e., the cervix must be ripe and the uterus irritable. The less prepared the cervix, the more protracted and dangerous will be the process of getting contractions started. The situations calling for induction are serious enough that the physician should, in all such cases, adopt such a procedure only after proper consultation.

Management of Delivery

No delivery is so normal that its outcome is a certainty. A normal labor progressing smoothly to a spontaneous delivery may be a simple procedure that can be successfully handled by a policeman in a taxi. The physician's value lies in his ability to conduct this episode with the utmost safety to the principals and to be prepared to meet complications, however they may develop. The total responsibility is his, and no part of it can be completely transferred to any assistant when things go badly.

Anesthesia. At the time of delivery, the type and degree of anesthesia must be determined by the condition of the patient, the available anesthetic agents, the ability of the attendant in charge of anesthesia, and the type and degree of intervention anticipated by the operator. In order of safety for the mother and baby, the types of anesthesia are local, regional and general. It does not necessarily follow that the safest delivery is one conducted without any anesthetic. Lack of control over the birth process may constitute greater danger than any introduced by an anesthetic agent.

Conduct of Delivery. The obstetrician must conduct the delivery in the safest possible environ-

ment. This means, of course, that aseptic technique must be utilized consistently. Deliveries should be accomplished in properly regulated hospitals whenever possible. If such facilities are not available, a home delivery should be conducted with the same respect for asepsis as would be required in a hospital. The neonatal care of the infant must be of the same caliber, whether it be in the home or the hospital nursery.

As the delivery progresses, the obstetrician must anticipate the ability of the vaginal orifice to accommodate the passenger. If it is apparent that the baby will cause some degree of laceration, an adequate episiotomy should be made. It is no credit to the physician that he delivers the child without incision and then has to repair an unexpected tear. It is better service to the patient to perform an episiotomy which can be carefully and anatomically repaired than to permit a laceration that becomes a major surgical concern.

The use of forceps (other than the simplest, outlet "shoe-horn" variety) is one of the most important and one of the most dangerous aspects of delivery. Such use implies some abnormality of size, position or presentation, and should never be entered into without adequate consultation and preparation. It is not within the scope of this paper to consider the various types of forceps and their indications. It may be said, however, that their use should not be considered unless the patient has been in active labor, in the second stage, for two hours if a primipara, or one hour if a multipara, without demonstrable progress in the form of change of position or station. Hasty delivery for fetal indications is rarely justified. Although frequent checking of the fetal heart tones in labor is essential, fluctuations of rate and rhythm must be evaluated cautiously lest they press one to injudicious action.

As soon as the infant's head is delivered, the air passages must be cleared so that the initial inspiration will be unobstructed. This can generally be accomplished satisfactorily with a bulb syringe. If the cord is entwined around the baby's neck, it can usually be loosened gently and slipped over the head or along the body as it emerges, only rarely requiring immediate clamping and cutting before the delivery can be completed. Generally, delivery of the head is followed without particular difficulty by the emergence of the shoulders. If, however, the anterior shoulder does not slip out easily, the danger of damage to the brachial plexus must be kept in mind. Fundal pressure is a much safer mechanism for delivery of the shoulders than traction on the head. As soon as the infant is delivered, he should be wrapped in a blanket and placed in a preheated incubator or crib.

Premature Delivery. The delivery of a premature infant imposes certain particular responsibilities on the physician. Labor must be conducted with little or (preferably) no analgesia. If the danger of narcosis to a premature baby is explained to the mother, she will readily accept the usual discomfort. The small size of the infant and lack of sedation increases the possibility of a precipitate second stage, so the course of labor must be attended more closely by the physician.

It should be kept in mind that this organism which is being abruptly forced into an untimely independent existence is more delicate in structure and functional balance than the term baby. The delivery should be conducted with local, regional or the minimum of general anesthesia, if any is required. Greater care must be taken in the delivery process. If the vaginal orifice is tight, an adequate episiotomy is desirable in order to lessen the pressure and subsequent release on the infant's head as it passes through. Warmth should be applied immediately while waiting for the cord pulse to stop. Oxygen must be administered more readily and consistently with premature babies since they are more sensitive to oxygen deprivation. Strict attention must be given to clearing the air passages since the premature infant is less able to clear these passages himself.

Breech Delivery. Breech presentation may pose some difficult decisions for the obstetrician. Upon discovery of this presentation as the patient nears term, he will be tempted to perform an external version. He will do well at this point to remember that (1) version may occur spontaneously at a later time, (2) indication of fetal distress will obviously prohibit further effort to turn the baby, and (3) an infant which can be turned easily will probably turn back just as easily since the condition causing the breech to be at the inlet will persist. The breech presentation, therefore, may better be left alone.

The chief source of grief at the time of delivery is the hasty attempt to extract the infant through an insufficiently dilated cervix. The multipara with a breech, if she has had a normal vaginal delivery previously, will probably progress to an uncomplicated delivery if the obstetrician does not interfere too quickly or forcibly. A primigravida with normal pelvic capacity and an infant of apparently normal size will also reach a happy termination if the attendant is not too impatient.

An adequate episiotomy is necessary, and the obstetrician must be capable of using forceps on the after-coming head if the need develops. Pressure on the cord as the trunk descends is an over-emphasized danger which should not press the physician to hasten the extraction unnecessarily. Once the infant's mouth is free and cleared of fluid, there is

no need for haste. Since traction on the trunk is most dangerous if the neck is twisted or angulated, the location and relationship of the head must be constantly visualized.

The most difficult problem of evaluation occurs in the mother with small pelvic measurements. The after-coming head is an unknown quantity until it is actually in the birth canal, and this may be too late to avoid serious trauma to the mother and baby —and obstetrician. The primipara with border line measurements and the occasional multipara with a poor pelvis or history of a dystocia may be candidates for cesarean section in the interests of the baby. The comforts of consultation are greatly beneficial to the obstetrician's peace of mind.

Care of the Newborn

Delivery Room Attention. The physician has certain responsibilities to the newborn infant, particularly to initiate respiration as rapidly as possible without producing trauma. Respiration is best established by gentle skin massage after a clean airway has been established by gentle suction; vigorous manipulation is to be avoided. The baby should lie with the head down slightly so that nasopharyngeal secretions will drain out.

The asphyxiated infant who refuses to breathe may pose a severe problem, as anoxia at this time can lead to life-long handicap from mental deficiency, cerebral palsy, blindness or deafness. Respiratory stimulants are ineffective since the anoxic respiratory center is refractory to them and they may be the final insult which causes a respiratory center to cease functioning completely. The imperative need is to get oxygen to the brain. If an initial gasp has produced some expansion of the lungs, gentle artificial respiration with administration of 100 per cent oxygen will effect this purpose. If no initial gasp occurs, it will be necessary to clear the passages by suction through an endotracheal catheter followed by introduction of oxygen under positive pressure through the catheter. Mouth-to-mouth breathing is a poor substitute but obviously better than nothing. Insufflation of the lungs always carries some risk for the baby and should receive the physician's personal attention. Removal of swallowed secretions by gastric suction eliminates this source of fluid that might be aspirated.

Some babies require closer attention than the average newborn. Complications of labor and pregnancy, i.e., premature delivery, breech presentation, cesarean section, multiple delivery, Rh sensitization, premature separation of the placenta, toxemia and diabetes produce babies who depart from normal physiology and show a tendency to die unexpectedly. These babies should be placed at once in heated, humidified incubators with flowing oxygen and, whenever possible, should be given special nursing attention. When the birth of one of these babies is expected, it is wise to have present in the delivery room another physician who can devote his full attention to the child even if the mother should be in difficulty.

Nursery Attention. Once the child's independence is established, the eyes should be treated with silver nitrate, as required by law, and immediately flushed with saline. If the child is to be introduced into a nursery, he must be adequately identified.

The newborn should be allowed to rest quietly for a few hours after delivery, and should receive a minimum of handling thereafter. The initial cleansing should gently remove only gross blood and mucus, leaving the bactericidal vernix in place. Weighing and measuring the newborn infant, checking the temperature (and, incidentally, the patency of the anus), and noting the skin color and texture and condition of the head and extremities should be routine activities for which the nursery attendant is responsible. This does not relieve the physician of the responsibility of a thorough examination of the infant as soon as practical after delivery. It is good medical practice and avoids the embarrassment of having parents discover abnormalities which have been overlooked.

Size is not always a good criterion of a baby's maturity. Mild heat should be applied until the ability to maintain body temperature is established, or until any fall in temperature attendant to delivery is corrected. A lusty cry at delivery is a heartening sound, but the most vigorous baby warrants close observation for the first few hours for evidence of respiratory difficulty, central nervous system defects or circulatory insufficiency.

Care of the Premature. The most important single factor in maintaining the premature after he is started is attentive nursing care. He should be transferred immediately to an incubator, and handling must be limited to that which is necessary to the maintenance of life. No infant's start should be jeopardized by such non-essential activities and exposures as weighing, measuring, or displaying for the benefit of the family. There is no need to disturb the infant for feeding in less than 24 hours.

The salvage of these children represents one of the greatest challenges in the field of obstetrics, and the obstetrician must take the primary responsibility since the pediatrician (if he is a separate individual) will probably not see the child until the most critical phase is past. Fetal mortality has not taken the same gratifying drop that maternal mortality has, but when it does it will be largely because these prematures and immature babies are being saved.

Management of the Third Stage

Delivery of Placenta. Firm contraction of the uterus after expulsion of the fetus can be made more certain by the administration of an oxytocic, preferably a preparation of ergot, as soon as it is evident that there will be no impediment to the completion of the delivery (and that it is not an unexpected multiple pregnancy). The only objection to the use of such a drug is the slightly increased incidence of retained placenta, but this can be avoided by attention to the activity of the uterus after the oxytocic is given and by fundal pressure at the proper time. The placenta should be inspected to determine whether it is intact, but a more practical indicator is the character of bleeding which follows. If the uterus remains firm and bleeding is slight, one can be reasonably certain that there is no retained tissue or that if there is any, it is better left to pass spontaneously unless the development of bleeding warrants intervention. This applies to retention of the entire placenta as well. As long as there is no excessive bleeding, it may be better to wait than to attempt manual removal.

Bleeding. During and following the third stage, the closest attention must be paid to the amount of blood loss. If there has been an operative delivery, or if bleeding continues at a faster than normal rate despite a well contracted uterus, the entire circumference of the cervix should be visualized. Lacerations should be repaired immediately. Packing the vagina without proper inspection of the vault and cervix may result in the damming up of blood and a degree of hemorrhage unsuspected until the patient begins to show secondary reactions. The episiotomy should be repaired without delay, but the blood loss here is rarely dangerous unless an unusually vascular area has been entered. It cannot be too strongly emphasized that here, as in the bleeding complications earlier in pregnancy, the obstetrician must constantly guard against underestimating blood loss. If this can be worse at one time than another, it is at that time when blood is not available or when its procurement is slow and difficult.

The Postpartum Period

The patient should be kept under constant observation for bleeding for at least one hour after delivery. This also assures her of attention if she should vomit and aspirate in the process of awakening. Delayed hemorrhage is fortunately not common, but the possibility of dangerous bleeding must be considered for at least 10 days.

Next to bleeding, the greatest danger in the postpartum period is infection. This, obviously, is most commonly of uterine origin. Urinary tract infections are not uncommon, but pelvic inflammations occur usually by the fourth postpartum day, while urinary infections are often delayed until the seventh or eighth day or later. The latter usually bring characteristic symptoms, but may show no response except fever and pyuria. Breast infections in nursing mothers usually do not develop until the second or third week.

The primary point of consideration is that the patient must be watched closely enough to catch the earliest indications of any complication. Second, a diagnosis should be made if evidence of infection develops. Third, proper antibiotic or chemotherapy must be initiated. This does not mean that complicated diagnostic studies are mandatory, but simply that one should examine the patient and then treat her rather than using the simpler expedient of shotgun therapy.

The physician too often considers his postpartum responsibilities to end when the patient leaves the hospital or decides she is able to resume her household activities. At least one check-up six or eight weeks postpartum is the absolute minimum of after care. This extent of follow-up, while better than none, overlooks the fact that the pelvic tissues do not return to their physiologic, non-pregnant state until some weeks later. The fact that most patients now expect a six-weeks check-up is a tribute to health education in recent years. The expectation of further check-ups should be impressed upon them in the future.

Consultations

It should be evident from these remarks that the committee feels that one of the most important factors in providing good obstetrical care is that the physician should realize and respect his limitations. It is no reflection upon his training or ability that he will at times need the advice and assistance of a colleague. The principal desire of any physician should be to provide the best possible care for his patients, and this may require the consideration of opinions other than his own. Obstetrics is the ideal branch of practice for the physician to appreciate and utilize consultation, for it is the only one in which two lives may be at stake at once.

PRESIDENT'S PAGE

Dear Doctor:

We have just finished a rather careful reading of the first volume of the report of the Magnuson committee. We have the very definite feeling that it leaves much to be desired. The committee undoubtedly has done a lot of work, spent a lot of money, and, to a greater or lesser degree, honestly tried to develop some facts and figures with regard to the nation's health.

Public meetings were held in key cities, at which time various individuals were asked to attend and express themselves. We attended one such meeting and decidedly were not impressed with the quality of the talent as it appeared. Some of the presentations were valuable. Too many made one wonder just how silly supposedly intelligent people can become after exposure to the dizzy doctrines of the past administration. The experience was enlightening but not heartening.

There seems to be much difference of opinion in the estimates of newspapers and commentators pro and con as regards the report. We believe that there are a few comments and conclusions that may seem justified. First of all, we fail to find where anything new has been developed or brought into the picture. The second conclusion which occurs to us is that throughout the whole text there still occurs and recurs consistently the same old refrain—federal aid.

Even more regrettable than the above is the persistent teaching of the spurious philosophy of the government owing everybody just about everything. A democracy endows its citizens with certain inalienable rights, not the least of which is the right to make one's own living and to provide for one's own welfare and future. These and other basic concepts have been the life-blood of this country throughout its existence. We fail to find any mention of anything so practical in this report.

Undoubtedly the report will be used by the do-gooders and the socialists to prove a great variety of points in their program. We hope it will not be taken seriously by the administration and thinking Americans. We are also definitely of the opinion that the FSA and the OASI, which are a part of the picture and which have repeatedly been pointed to as the greatest swindle ever perpetrated on the American people, should be terminated. If necessary, an agency should be set up in their place with at least a semblance of actuarial sense.

Mr. Oscar Ewing is out of the picture. Steps should be taken to insure that he will be closely followed by Falk, Cohen, Altmeyer, Davis, Kingsley, and others of that stripe.

Sincerely,

EDITORIAL COMMENT

Your School of Medicine

Editor's Note. The following article was prepared by Dr. W. Clarke Wescoe, dean of the University of Kansas School of Medicine, and presented for publication in this issue of the Journal at the request of the president of the Kansas Medical Society. The Society is grateful to Dr. Wescoe for his enthusiastic co-operation and submits to the physicians of this state the story of the School of Medicine, its recent progress, and its future plans. Should additional copies of this article be of interest, they may be obtained by writing the Society, 315 West Fourth Street, Topeka.

It is a great personal pleasure for me to be able to present this report to acquaint you with facts and figures showing just what your University of Kansas Medical Center is doing to discharge its three primary obligations—education, medical service, and research—and to point out what remains to be done.

On February 18, 1949, the Honorable Frank Carlson, then governor of Kansas, signed the bill "Rural Health Program for Kansas," which had been passed by both houses of the legislature. It was the purpose of that bill to provide major expansion of the University of Kansas Medical Center in order that more doctors, nurses, medical technicians and other ancillary personnel might be trained to alleviate a serious and growing shortage of such personnel in the state. A sum of $3,862,560 was appropriated for such expansion. All but one of the major buildings provided for in that bill have been completed or are now in the process of construction; the psychiatry unit remains to be constructed, but its building plans are in the final stage.

This Rural Health Program has become of major historical interest not only in Kansas but in the entire United States. The forward-looking attitude of Kansas legislators has focused the eyes of the nation upon this state. This one bill has literally made the name Kansas synonymous with medical progress throughout the United States. The health program it outlines has served as a stimulus for many other states to plan toward the solution of their rural health problems. That the program has been successful is an acknowledged fact.

At this time, approximately four years after the passage of that bill, a report is due the people of Kansas as to what the Rural Health Program has done for Kansas and how, looking ahead, we should be planning.

Medical Education

Better medical care for the people of Kansas depends, as it does for all people, upon the training and knowledge of the medical team. The University of Kansas Medical Center is your school for training new medical teams and maintaining the proficiency of those now in practice.

The University of Kansas School of Medicine is now a national leader in medical education. In 1951-52 it was third* in the United States in the total number of personnel trained by a medical school faculty. Further, it ranked second** in the number of practicing physicians receiving further training through refresher and circuit courses out of 79 United States and 11 Canadian medical schools.†

Increased Enrollments

The number of medical students in the University of Kansas School of Medicine has increased progressively since 1949. There are now 450 students enrolled for medical degrees. This figure contrasts to the 348 enrolled at a similar time four years ago.

At the time the Rural Health Bill was passed, the promise was made that medical student enrollment would be increased from 80 to 100 students per class. The School of Medicine has exceeded that promise. This year there are 121 freshman medical students, of which number 114 come from the state of Kansas. Students from Kansas account for somewhat more than 93 per cent of the enrollment in the freshman class. Further, it should be mentioned that in the 78 medical schools in the United States outside Kansas, there are only 15 Kansans enrolled in freshman classes. The University of Kansas School of Medicine, therefore, is taking care of 90 per cent of the students of Kansas who have the necessary qualifications to study medicine. There is no doubt that most or all of these 15 persons from Kansas who are attending medical schools outside the state are doing so by their own choice.

Modern medical care requires not only the services provided by doctors but also the important professional and technical services provided by nurses, medical technicians, x-ray technicians, dietitians, physical therapists, and others. The K. U. Medical Center has training programs for these additional students, and enrollments in these fields also have increased. In 1949, nurses and technical medical trainees totalled 212. This number has increased to 250 in 1952.

All told, counting medical students, doctors undergoing further training, nurses, and the other tech-

*The first two were the University of Minnesota and the University of Michigan.

**The University of Michigan was first.

†Journal of the American Medical Association (Educational Number) 150:112 (Table 11) Sept. 13, 1952.

nical personnel necessary to medical care and rehabilitation, 2,172 persons were enrolled in 1952, an increase of 621 over the 1,551 enrolled in 1949.

Of what do these totals consist? The following table gives the complete breakdown:

DETAILED TABLE OF ENROLLMENTS

	1949	*1952*
Medical students	348	450
Resident physicians	51	69
Interns	22	19
Physicians in postgraduate courses	918	1,382
Nursing students	140	162*
Dietetic students	13	20
Medical technologists	17	11
X-ray technicians	3	4
Physical therapy students	23	12
Occupational therapy students	16	35
Speech correctionists, students	....	7**
Teacher training for hearing and speech	....	1
Totals	1,551	2,172

*Including practical nursing students, a course initiated in 1951.
**Course initiated in this year.

Surveys by the Association of American Medical Colleges prove that physicians are more likely to establish practice in the states in which they receive their medical training. The greater number of medical students, therefore, means a greater number of physicians, surgeons, and teachers for Kansas in years to come.

Expanded Posgtraduate Program

The likelihood of Kansas medical graduates staying in Kansas is even greater when opportunities for continuing professional study are made available to practicing physicians. Since the passage of the Rural Health Bill, the University of Kansas School of Medicine has embarked upon an enlarged program of postgraduate medical education. This program offered instruction to almost 1,400 physicians in 1951-52.

Very recently, a Department of Postgraduate Medicine has been established so that the School of Medicine now has for the first time a department, with a full-time chairman, devoted to the particular educational needs of practicing physicians.

Attracted International Attention to Kansas

The postgraduate training program has attracted much favorable attention to Kansas, not only from other states but from other countries as well. Medical school deans from Canada, New Zealand, Thailand, Burma, India, and Iran have visited the University of Kansas Medical Center as one of the few schools in the United States they *wanted* to visit in order to find out more about this postgraduate educational program.

Of what does this postgraduate program consist? Practicing physicians who want to learn more can receive training from the University of Kansas School of Medicine in any of the following ways:

1. Two- to six-day refresher courses are held in Kansas City at the K. U. Medical Center, beginning in October each year and continuing through April. By April, 1953, 15 such refresher courses for physicians will have been held during the present academic year. Similar courses in the year 1951-52 were attended by 768 doctors. Refresher courses are also scheduled for nurses and medical technicians.

2. One-day-a-week or one-day-a-month continuation courses extending over several weeks or months are held at the K. U. Medical Center. From October, 1952, to April, 1953, four of these courses are scheduled. In 1951-52, 119 doctors attended.

3. Circuit courses are taken out to the cities of Kansas every month, December through April. A team of two or three K. U. Medical Center faculty doctors, together with a field representative, ride the circuit in a car loaded with projectors, screens, notebooks and other teaching materials, putting on an intensive course in each town. Eight carefully selected cities throughout Kansas are the sites for these courses, selected so that the instruction will be easily available to all Kansas doctors. This is taking information about medical advances right out to physicians who cannot leave their practices long enough to come to Kansas City for longer courses. In the academic year 1951-52, 474 doctors attended circuit courses.

Medical Service

In order to teach physicians, medical students, and other medical personnel, many patients with a variety of diseases are needed. In fact, one measure of the effectiveness of a medical teaching program is the number of patients available for study by the students.

In 1952, 12,313 patients from 103 Kansas counties were admitted to the K. U. Medical Center, each spending an average of 12 days.

In addition, the outpatient clinics recorded 77,725 patient visits in 1952. These walking patients give students experience in an office-type practice and provide necessary knowledge of ailments not requiring hospitalization.

Research Vital

But patient care and teaching are not enough. Research in medicine is vital for the continued discovery of new ways to improve medical care and shorten illness. Research is necessary and vital to

the University of Kansas Medical Center, as to any medical school, not only for the direct products of research—improved treatments and methods for discovering disease—but also to provide the atmosphere which is stimulating to students and faculty members alike. Medicine is not a trade—it is a way of life, a perpetual curiosity about the nature of disease and how to prevent and cure it. The active research program at the K. U. Medical Center makes the educational program more effective and adds to our knowledge, enabling us to give better medical care in Kansas.

An active research program and adequate research facilities serve also the practical purpose of attracting the caliber of teachers needed in a great medical school. Were research activities lacking in the K. U. Medical Center, many of our most effective teachers would go elsewhere, where such facilities and activity could be found.

Forty-nine individual research projects are now under way at the University of Kansas Medical School. Cancer alone accounts for nine of the studies. All sorts of approaches are being used to find out more about this killer—what goes wrong initially with body cells to change them into wildly growing cancer cells, what the various body chemicals have to do with starting and stopping cancer growth, how to diagnose cancer earlier when it is all in one place and curable. Such special instruments as the electron microscope are used to study the fine points of cancer cells with magnifications of 100,000 times. Every conceivable effort is being made to learn more about this deadly disease.

Research on polio at the University of Kansas Medical Center has made a major contribution to the international pool of medical knowledge of this disease. The K. U. School of Medicine is one of the three schools in the country where viruses causing polio have been discovered and identified. Only by finding all the variations of virus that cause this disease can a vaccine for its prevention be made.

Heart reserach and its practical applications are also being studied. Yours was one of the first institutions where disease-tightened heart valves could be opened and where heart malformations occurring in some babies could be corrected surgically. Six heart disease research projects are now under way

Interest on the Investment

There are many interesting figures that point out the success of the Rural Health Program. These can be summarized briefly by the following facts: (1) More of our graduates are remaining in Kansas to become Kansas doctors; (2) more physicians are settling in small communities; (3) Kansas is gaining physicians. The concrete figures are these:

1. Of the 2,131 living alumni of your University of Kansas School of Medicine graduated before the Rural Health Program became effective, 742, or 35 per cent, are practicing in Kansas. There were 84 young doctors in the first class (1951) graduated after that program was instituted. Of these, 49 have now settled to practice; the remaining 35 are completing internships or are in military service. Of the 49, 42, or 86 per cent, are settled in Kansas. Admittedly these latter figures are small but the

Service Separations

As a service to physicians and communities in this state desiring additional medical personnel, the Journal of the Kansas Medical Society will publish in this column each month the names of medical officers who will shortly be separated from the armed forces. These are men who volunteered from Kansas, and many of them will probably be interested in finding locations in this state. Anyone interested in contacting these physicians may write to the address here given.

Niles A. Borop, Jr., M.D.
U. S. Army Hospital
Camp Carson, Colorado

Bernard A. Brungardt, M.D.
137 North 9th Street
Salina, Kansas

Herbert Bunker, Jr., M.D.
U. S. Army Hospital
Fort Riley, Kansas

James H. Enns, M.D.
211 S. E. 4th
Newton, Kansas

Charles C. Gilkey, M.D.
1731 Clay Street
Topeka, Kansas

Charles R. Hopper, M.D.
172 Artillery Loop
Fort Sam Houston, Texas

Edwin R. King, M.D.
1708 First Street, N.W.
Washington 1, D. C.

Robert V. Kirk, M.D.
248 West 12th Street
Horton, Kansas

Ward A. McClanahan, M.D.
1425½ Buchanan
Topeka, Kansas

Arthur W. McMahon, Jr., M.D.
Winter V.A. Hospital
Topeka, Kansas

Don R. Miller, M.D.
1847 Oakland
Kansas City, Kansas

William J. Reals, M.D.
Wichita Hospital
Wichita, Kansas

Alex Scott, M.D.
1904 L. Street
Belleville, Kansas

Joseph E. Seitz, M.D.
Wakeeney, Kansas

Dana A. Tompkins, M.D.
Route 2
Bonner Springs, Kansas

Richard C. Tozer, M.D.
Winter V.A. Hospital
Topeka, Kansas

John L. Weaver, M.D.
4206 Prairie Lane
Mission, Kansas

Robert Weimer, M.D.
206 Third Street
Fort Leavenworth, Kansas

trend is unmistakable. *We are holding our graduates now.*

2. In 1950 and 1951, 79 physicians began practice in Kansas towns with populations of 1,500 or less. This was the first reversal of the trend away from rural practices in the past 50 years.

3. In the years 1900 to 1950, Kansas consistently lost more physicians than it gained. In 1950 this half-century trend was finally reversed. In that year, instead of losing, Kansas gained 100 physicians. This gain was continued in 1951 with the same number.

These gains are even more dramatic when considered against the background of national events. Gains were registered despite the inroads of the military services on civilian physicians. Had it not been for the large demands of the military, Kansas would have profited even more.

Mental Health Program

Very recently, plans have been laid by the School of Medicine and the Board of Social Welfare to start a preceptorship program in the mental hospitals of Kansas. Each senior medical student will spend six weeks working and learning in a state mental hospital; groups of 15 students will be rotated so that the hospitals will be staffed the year around. By showing students the opportunities and problems that exist in these institutions, we will provide a stimulus for filling the trained personnel gap that exists.

This program, too, is a matter of interest returned on the investment.

The Future

A great deal has been accomplished for Kansans in the past four years with the original 3.8 million dollars, a sum that was conceded at that time to be insufficient to complete the University Medical Center. We feel a duty to point out that a great deal of momentum has been generated, a momentum that, if continued, makes possible even greater progress in meeting the health needs of the people of Kansas. This momentum cannot now be allowed to spend itself.

In order that gains may be consolidated and that the academic program may be carried on successfully, certain additions to the present physical plant will have to be made. These critical additions are outlined below.

1. *An Addition to the Administration Building for Educational Services.* This building would include facilities for the library of the School of Medicine, our most urgent need.

For some time the library facilities on the Kansas City campus have been inadequate for medical students, nurses and other technical students. Since 1941 and earlier, the library of the University of Kansas School of Medicine has ranked consistently in the lower fourth of the medical school libraries of the United States. This situation has deteriorated even further because of a tremendously increased student load without any increase in library facilities, books, or personnel. When compared with other Big Seven medical schools, the University of Kansas is at the top of the list with but one exception—its library is at the very bottom.

The University of Kansas has now been fortunate enough to obtain the services of one of the country's outstanding librarians. In consultation with him, we have estimated the necessary long range library requirements for this institution.

In addition, this wing would contain necessary facilities for clinical laboratories as well as adequate quarters for housing interns. New intern quarters would allow the opening of their present rooms into an income-producing hospital ward.

It is a reasonable estimate that a sum of $1,000,000 would suffice to construct this very necessary addition.

2. *The First Year Facilities.* Adequate training for a first year medical class of more than 100 students is nearly impossible with the present facilities available on the Lawrence campus for the teaching of anatomy, biochemistry, and physiology Conditions are such that classes must be taught in split semesters and not by the progressive rotation which is accepted by all medical educators as being the best curriculum. Anatomy classes, for example, are being taught in some instances in an area which is really a corridor of Haworth Hall.

For adequate teaching, it is essential that these physical inadequacies be corrected. An addition to the Medical Sciences Building of the University of Kansas Medical Center is needed. It is felt that the cost of the establishment of this facility would be $1,250,000. With this facility in operation, 120 first year students per year can be trained adequately, and Kansas will have a consolidated school of medicine.

3. *Facilities for Neurological Patients.* At present, although we have an outstanding group of neurosurgeons and neurologists, there is no adequately equipped ward for the care of neurological patients. These facilities are becoming more important each year because of the increasingly aged population. An adequate neurological and neurosurgical service, from the standpoint of early diagnosis and rehabilitation, is important to the public and mental health of Kansas, a state with a large number of older people.

In order that a complete neurological and neurosurgical service be possible in the K. U. Medical School, it is necessary that two floors be added to

the presently planned psychiatry building, these at an approximate cost of $300,000.

4. *Power Plant.* When these facilities have been completed, it will be necessary that the present power plant be expanded. At that time a power plant should be built which will adequately fill the needs of the K. U. Medical Center for as long a time as can now be foreseen. It is the estimate of the state architect that such expansion will cost approximately $175,000.

These are the facts. A great deal has been accomplished. Some remains to be done. The interest on the original investment continues to pour in for the better health of citizens of Kansas. An investment of $2,725,000 will serve to give Kansas a consolidated medical school and an unsurpassed university medical center.

During the past four years Kansas has set the pace for the nation in developments inevitably leading to better medical care. The pace with which the Kansas program is to be pushed forward must be set by our citizens and our legislature.

Annual Mid-West Cancer Conference

The Fifth Annual Mid-West Cancer Conference, sponsored jointly by the Committee on Control of Cancer of the Kansas Medical Society and the Kansas Division of the American Cancer Society, will be held at the Broadview Hotel, Wichita, on April 2 and 3.

The guest speakers, all noted specialists in the fields of practice in which cancer is a problem, are as follows: Dr. William Boyd, University of British Columbia, Vancouver, B. C.; Dr. Paul C. Bucy, professor of neurology, University of Illinois College of Medicine; Dr. Ernest M. Daland, chief of staff of Pondville Hospital, Walpole, Massachusetts; Dr. Juan A. Del Regato, director of Penrose Cancer Hospital, Colorado Springs; Dr. Cushman D. Haagensen, associate professor of clinical surgery, Columbia University, New York; Dr. Henry S. Kaplan, professor of radiology, Stanford University Hospitals, San Francisco; Dr. Cornelius P. Rhodes, director of Memorial Hospital, New York; Dr. Isidore Snapper, director of medical education, Mt. Sinai Hospital, New York.

A banquet will be the feature of the program for the evening of April 2. One of the scientific speakers, Dr. Rhodes, will address the group on "Horizons in Cancer Research." The wives of physicians attending the conference are invited to attend the evening session and will be entertained at other times by members of the Woman's Auxiliary to the Sedgwick County Medical Society.

Those planning to attend are urged to make hotel reservations immediately, direct with the hotel of their choice in Wichita. Registration for the conference will begin at four o'clock on Wednesday, April 1, and continue until ten o'clock that evening. The desk will also be open through the days of the conference. No registration fee will be charged.

This annual conference is growing in prestige with each presentation, and is now anticipated with pleasure by a large number of Kansas physicians. The program is of interest to specialist and general practitioner alike, and is one which is deserving of the support of all.

How to Win Patients and Influence Doctors

Editor's Note. The following is a condensation of a talk presented by Dr. Alfred R. Sugg, Ada, Oklahoma, to the Kansas Medical Assistants' Society at its annual convention, April 28, 1952. It is printed here at the suggestion of physicians who heard the paper and felt that others would be interested in Dr. Sugg's philosophy.

The only thing I know is what I have seen and experienced in a quarter of a century on the front line, dealing with what I am sure are the problems that you face daily, also. I have heard executives emphasize the importance of attention to details: that attention to details is the all important, the *sine que non* of a good assistant. I disagree.

A proper overall objective comes first, and if properly conceived the details will naturally and inevitably follow. "The centipede was happy quite until the frog in fun said, 'Pray which leg comes after which?' That raised his mind to such a pitch he lay awallowing in the ditch considering how to run." The centipede has an objective and the equipment with which to get there. So when he turns all holds loose and starts running, the legs just simply seem to fall in place at the proper split second and never seem to get in each other's way.

One of the tragic faults or shortcomings of men and women seems to me to be the inability to see opportunities for service at hand here—*now*. Many of us seem to feel that somewhere out yonder—or tomorrow—we could do—achieve—live fully—while all the time opportunities lie on our very door step.

The Holy Grail has done more for me than any book or sermon or lecture that has ever come my way. You remember the story—Sir Launfaul set out with big entourage in quest of the Holy Grail. On his way out he passed a beggar at the gate holding a cup begging alms. What notice the knight gave him, if any, was of scorn. He searched far and wide, but the object of his search eluded him. Returning, crestfallen and discouraged, he felt compassion for

the beggar—and of course the cup he held was the Holy Grail.

And then the immortal lines:

"Not what we give but what we share
For the gift without the giver is bare.
Who gives himself with his alms feeds three—
Himself, his hungry neighbor, and me."

A great improvement in the conduct of our offices and the patient-doctor relationship would be to change our program somewhat. I know that in our state at least, we are always having the doctor address the medical assistants. Now that is all to the good to a degree, but I think turn about is fair play, and you folks have much to offer us and should have a chance frequently to come before our meetings, take your hair down, and expound the patient-doctor-assistant relationship from a different point of view—your point of view.

The successful outcome of many of the problems in human affairs turns on the emotional, psychological, if you please, and no stone should be left unturned to explore the possibilities here.

The morale, esprit de corps, then, must be one of the big objectives of any office. It is not so much what we say or do, but rather how we say or do it. The overall atmosphere of a definite desire to make the office hum should be so well understood and appreciated that mutual assistance and even criticism should be a part of our daily lives. Any organization, be it small or large, and especially is this true in the field of medicine, has a distinct personality of its own.

I would rather have an organization with a soul and without a sou as vice versa. I am questioned frequently when it is noted that my personal office nurse has been with me almost a quarter of a century, and others in the organization have been there for extremely long times, how in the world we keep them. Someone asked recently to see the contract under which my nurses work. Well, we have no contract and very little understanding, and that goes for the doctors as well. They simply go to work, and stay as long as they like. Mutual profit, dignity and respect are the keystones on which a satisfactory medical organization can be established. And I believe that every one of you would work and be satisfied at a minimum salary if your employer took pains to see that your dignity and mental integrity are protected. When, for any reason, you cannot return the compliment, you should of course ask to be relieved.

The least desirable of all medical assistants are ones who are not sold on the job—ones who have not adopted it as a profession and a way of life. If it is only a means to an end, it will prove futile for all concerned.

You absolutely must like people, even sick, unreasonable, cantankerous people, or else you will be bored stiff and will probably degenerate into a clock-watcher, than which there is no more demoralizing situation in which you may find yourself. One thing is certain—that this interest cannot be simulated. You can't depend on good looks, back slapping or the gushy type of approach. You must have the gentle light from inside that radiates from a genuine interest and understanding of the problems, and willingness to follow them at all costs.

Mentioning the fact that patients are sick people, it must be remembered that every one who enters the doctor's office is sick. It may be worry, anxiety, frustration, a constitutionally inadequate person, one whom nature has cheated, or the fates have frowned upon. Whatever the circumstances are, the fact that they come in, means that they are sick. It is tremendously surprising over the years to recall the successful solution of medical problems by medical assistants and their attention to little personal problems.

We are trying in our place to emphasize the professional side of medical care, rather than the merchandising or business side. And here, too, the assistants of all types, with proper indoctrination, can be of utmost help. People are always coming in and asking the price of a chest x-ray. Our stock answer is that we charge nothing for x-rays of the chest, and the same goes for blood counts, urinalysis, and what have you. Of course, the majority of applicants are astonished at the answer, but we take the time, the girls do especially, to find out why they want the x-ray. They then explain that the doctor will give his professional opinion as to whether or not they have tuberculosis and for that service he will charge a fee, but the x-rays, laboratory work, and all such are merely his tools and he makes no charge for them. The point is to try to get people away from mechanized diagnosis, to make them understand that professional opinions are the services for which they pay and that these are arrived at through many sources. We have found that they like it that way, and that it does add to the dignity of the practice of medicine.

If you adopt the proper philosophy of life as applicable to an assistant in a doctor's office, where the patient is admitted on his own motion and then treated as an honored guest, if you comprehend that the Golden Rule is not only a religious truth but is also scientific physical law, that is, that all action ends in reaction, and every bit of energy expended toward the patient's welfare will as surely return as will the echo in the mountains; if you add a natural God-given quality of curiosity, this business of helping make a medical organization go, can be, I know, tremendously exciting and satisfying work.

For a long time it has been considered a part of medical ethics to hold the doctor-patient relationship as sacred as religious freedom, and any deviation or breech of confidence or revelation of medical secrets by the physician has been frowned upon by all doctors, but there are many times as many assistants as there are doctors, and their indoctrination in this part of ethics has not always been of the highest type. We have seen confidential matters leak out of the office on a few occasions and have heard of them in many more. The one and only thing for which I would fire a girl summarily, is for talking shop at home or at parties.

Your most difficult specific task is the appointment problem, and it is a grave one. One thing only I know for sure. If, for any reason, patients can't be seen, tell them frankly—and *early*.

The *nice* patient who doesn't complain when she waits—who sees others seem to come later and get attention quicker—who is kept on the hook by puerile platitudes and cooked-up excuses—she may be the nice patient, but she is likely to be the one who never comes back. She can get revenge for being pushed around and don't think for a minute she won't do it. She not only won't come back, but she uses the incident to poison others. She must laugh, cynically to be sure, when she observes us—so frantically spending our money to further public relations, speeches, radio, newspaper, committee meetings, when a dime's worth of time and attention by some alert medical assistant would have had her "in the bag." I doubt if we can buy friendship or good will. We have to earn it and deserve it, and you are the shock troop brigade on which we must depend.

It goes without saying that loyalty to your doctor is one of the choice ways to influence him. However, this item can be slightly overdone, especially if you overdo the defense of your doctor. There is no cause to take up the cudgels every time anyone says or insinuates that the Doc could stand a bit more learning, manners or patience. If it is a small thing brought up by a small person, it will blow over, the blaze will be less with the least fanning. If it happens pretty regularly, it might be well to look into the matter and bring it to his attention the best way you can. Most any way will be the wrong way. There are some people who just won't see your doctor or your group in your way. It seems odd to you, but no amount of arguing will bring them around. It is better to stay home and saw wood than to start a one-man campaign for the boss. "Tend to your knitting" was grandmother's phrase for it. And slipping a barb into competitors is no good either.

I am sure you girls have long since discovered the easiest way to bring your doctor to see things your way—flattery, I am certain, you have tried. If not, do so at once, for we are all suckers for that bait. Just remember though that flattery is like a rich and expensive perfume—don't use it lavishly—just a touch here and a pat there is more effective.

It really takes a sense of humor to get along in this troubled world now at most any job, and certainly this is a most advantageous facet of the character of one who deals with sick people. There is always enough humor taking place in the office to relieve the stress, however, if we have an eye to see it.

A mechanic or technician who screws on a nut or adjusts a lever can be taught. A medical assistant is a person dealing with people, and no amount of lecturing will do much good. If you don't manicure nails at home, wear neat clothes, and automatically practice good manners, you will likely fail when you come to the office to "put on office manners." A great trait that is susceptible of cultivation is a knack for being natural—that is for being yourself

Religion and politics are two items that of necessity must be discussed very little by the doctor's assistants, especially at the office. To be sure, one's politics and religion are his own, and his opinions are his own and should be respected, but I know of no surer way to antagonize a large section of your clientele, and drive them away and make yourself unpopular, than to have fixed and voluble opinions on these subjects, especially if you are unable to approach either except on an emotional plane, and that goes for most of us. To shout your opinions is not only bad taste, it is first-hand evidence of an inherently intolerant person. It is to be remembered first, last, and always that the other fellow has equal right to make up his own mind and form his own opinions without any unsolicited help from you.

Tolerance is a positive virtue anywhere and any time, and it is a quality of character that will especially win patients. How any person can be intolerant of another because of his color, speech, occupation, etc, is beyond me, and it is doubly bad to condemn whole races, or groups, or to generalize. One of the most obvious traits of an inferior person is to pass judgment on another whom he does not know because of the group to which he belongs. In every instance when you are tempted to scorn, it is better to say, "There but for the grace of God go I."

I am not here attempting to eulogize either Democracy or Christianity or even to say these established and cherished institutions are right, but I would say that if they are right then all people must be included and treated on individual merits—and how completely this applies to the doctor's assistant. If you are intolerant, you are probably cynical. If

you are cynical, you are sick and need a psychiatrist —and quick.

I hear much complaining these days, not only in medicine but in all walks of life, about the terrible times in which we live. While there is no gainsaying the fact that it is not exactly the time for sissies, or milquetoast personalities, it is my honest opinion that this is the best of all possible times since history was recorded to be alive, and this particularly applies to medicine and medical assistants.

If the times present danger, they also present opportunity. If there has been much accomplished to make our profession outstanding, there remains much more to be accomplished. The times challenge our faith and our beliefs, and they challenge our ability to handle our emotions, especially our hates and fears, and in spite of the great progress in the laboratory, there has not yet been devised a test that will measure the cause, gauge the heights and depths and prognosticate the ravages of our fears, and we have no antibiotics that can possibly be applied to them for a speedy cure. The therapeutic measures that we offer our maladjusted patients, often, I am sure, could be applied with great benefit to ourselves. If we can and will adopt the method of searching introspection and apply the horse-sense and gumption that we have to adjust ourselves to what may come, with patience and fortitude, great progress may be expected.

The privileges and inheritance handed over to me by my father, to accept responsibility and the chance to work out my own way in life, to succeed or fail, are far too precious for me not to defend and pass on to my son. If only Patrick Henry could say, "I know not what course others may take, but as for me, liberty or death," then we may as well pull up stakes and give the country back to the Indians and move in with communists where we belong. We have developed a sort of national neurosis, and complaining is the chief characteristic. In God's name, let us begin to give thanks for the wonderful time, the wonderful opportunities, the challenging problems, the rich rewards that are ours.

A.M.A. Interim Session

Editor's Note. The following report of proceedings of the A.M.A. interim session held in Denver in December was prepared for the Journal by Dr. L. S. Nelson, Salina, senior delegate from Kansas. Dr. John M. Porter, Concordia, the second delegate from Kansas, also attended the meeting.

The Public Relations Conference which was held on December 1 in Denver proved to be better attended than any previous session and was very stimulating and interesting. Out of it have come some rather definite conclusions, the first being that the consensus of informed opinion today is that medicine's toughest problem is winning a favorable public opinion.

Then, classifying the agencies whereby medicine, through service, may win more favorable public opinion, are two important services which doctors can render. Those are rendered through emergency medical service plans and grievance committees.

Allowing the public to know, either through paid advertisements or news items, that organized medicine is trying to give emergency service every minute of every day in the year, is proving helpful. Doctors everywhere really want to give good and complete service, and while plans vary considerably according to the wishes of county societies, their size and location, the fundamental idea is the same everywhere. It is the moral obligation of every member of our profession to fulfill his responsibility by serving his allotted time or being responsible for seeing that someone else does if he cannot.

Grievance committees serving our members indicate that the vast majority of cases coming to their attention concern charges for services. Usually the patient has failed to tell the physician his true financial status. The committees usually bring the disputants together and the facts are presented, which is often all that is needed. The committees are composed of physicians who are older and respected by their conferees. Sometimes lay secretaries prove most helpful. Everyone is agreed that where the committee functions properly, public relations improve. These committees and emergency medical service plans have increased through the last year until there are more than 600 different plans in operation today.

The literature extant relative to public relations and available to all members of the American Medical Association is really excellent. Sometimes the facts therein may seem brutally frank, but they are based on careful appraisal and show clearly a way of ethical modern practice of medicine in keeping with improved public relations. It is recommended reading not only for physicians but also for their receptionists and secretaries and nursing and all ancillary aides. One in particular, *Putting PR to Work,* is a digest of the proceedings of the first medical public relations institute which was held last September in Chicago. This is undoubtedly good reading for all.

Dr. Bauer's presidential address was one of the most practical and pointed we have read. He told us, for instance, that there are more doctors per thousand population being graduated annually in the United States today than ever before; that the present ratio in our country is the highest in any civilized land. Distribution is the only area in which

there is fault. Community responsibility in supplying acceptable facilities is helping improve distribution.

He feels, as many do, that specialty boards should revise their requirements by remembering that the best specialists are those who have a background of general practice. It would also help solve the urgent distribution need if these boards would require one or two years of general practice in a small community as a requisite for board examination. Many of us who have been vitally concerned with "The Kansas Plan" inaugurated by Dr. Murphy can agree wholeheartedly with all phases and implications of this practical suggestion.

The care of non-service-connected disabilities in Veterans Administration hospitals struck sensitive nerves on all sides, and your delegates believe that the signing of the "Pauper's Oath" by people to whom it does not honestly apply is a reflection on the legal interpretation of the executive branch of government. The law is not remiss and does not need changing. It does need reinterpretation. American Legion posts and service officers all over this land should read the address of the National Commander of the American Legion which was delivered to the House of Delegates of the American Medical Association in Denver. No one could criticize the content and, therefore, I take the liberty of quoting two paragraphs from this address:

"There seems to be agreement between the Legion and the medical profession and the hospital people that there is justification for certain types of cases which are non-service-connected being treated by the Veterans Administration. These are the types of illnesses which make the patient a public charge under most circumstances. Specifically, I refer to the tubercular, the neuropsychiatric cases and the cases of chronic illness where over 90 days hospitalization is required. The position of the American Legion is that if these categories of non-service-connected cases are accepted as under the present law, that we, the American Legion, stand willing and ready to join with the American Medical Association, American Hospital Association, American Dental Association and all others to prevent the non-service cases which we might term 'chiselers' from ever receiving treatment by the Veterans Administration. The presence of such an individual who can afford to pay for his private medical care in a Veterans Administration bed means to us that he is depriving a worthy and qualified veteran from receiving the care the Congress and the people of this country intend for him to have.

"Believing as we do the above principles, we think that the present law, P.L. 312, should stand without the dangerous procedure of tampering with it in the Congress. By the same token, we believe that the enforcement of the present law by administrative means should be reconsidered with every American demanding its fair enforcement."

Be it known to all members of the Kansas Medical Society that the American Medical Association contributed another half million dollars to the American Medical Educational Foundation. While the returns from doctors have been rather slow, and particularly slow in the state of Kansas, it is certainly true that a growing number of physicians have felt a responsibility toward medical education to the extent of including it in their donation budgets for each year. This is certainly as it should be. We cannot fight against federal financing of medical education without finding ways and means to finance this important type of education in some other manner, and certainly contributions to this worthy cause are concrete evidence of our unified stand against federal financing of medical education.

Your delegates appreciate the honor of representing Kansas as best they can among the 200 delegates from all over the land. We have made many friends and have found the meetings stimulating and of great interest. It is difficult for us to bring home to you here a graphic picture of the type of democracy at work which we find so refreshing in these meetings. We are always hopeful that more Kansas doctors will attend, not only the scientific sessions but also take a few hours time to visit the House of Delegates meetings which are open to all members of the American Medical Association. This would serve the double purpose of teaching our members more about the organization to which we all belong and also, by discussion, help the Kansas delegates to better represent this component society.

Kansas Heart Conference Day

Kansas Heart Conference Day, consisting of a program on heart disease especially designed for the general practitioner, will be observed at the University of Kansas Medical Center, Kansas City, on Friday, March 13.

Previous conferences of this nature have been held at Winter VA Hospital, Topeka, under the sponsorship of the Kansas Medical Society's Committee on the Study of Heart Disease, the Kansas State Board of Health, and the University of Kansas School of Medicine. The place was changed this year to allow visiting physicians to see televised procedures and electrocardiograms via telephone since facilities for both are available in Kansas City.

Many aspects of heart disease have been studied

at previous conferences. The program this year will give emphasis to electrocardiography.

The program to be presented during the day is as follows:

8:30 Registration.

9:00-11:00 Cardiac Emergencies — Dr. Herman K. Hellerstein, Cardiac Department, Western Reserve University, Cleveland, Ohio.

11:00-12:00 Demonstration of EKG via Telephone.

12:00-1:00 Air Transportation of Cardiac and Lung Cases—Dr. Vincent H. Downey, U.S.A.F. School of Aviation Medicine, Montgomery, Alabama.

1:00 Luncheon.

1:45-2:30 Present Status of Ballistocardiography —Dr. Kurt Reissmann, associate professor of medicine, University of Kansas School of Medicine.

2:30-4:30 Myocardial Infarction and Hypertrophy—Dr. J. Willis Hurst, Cardiologist, Emory University, Atlanta, Georgia.

Nominations for 1953

The Nominating Committee of the Kansas Medical Society, consisting of five past presidents, met at the Town House, Kansas City, on January 20. This is in accordance with the Constitution and By-Laws of the Society, providing that two candidates for all elective positions shall be named by the committee not less than 90 days prior to the annual meeting.

The listing of these candidates in the *Journal* does not preclude the nomination of any other member of the Society. When elective positions are filled, at the time of the meeting of the House of Delegates on May 7, the presiding officer will call for nominations from the floor for each position.

In the list below, the names of present officers of the Society are marked with an asterisk.

Candidates for 1953

President-elect	*Murray C. Eddy, M.D., Hays Thomas P. Butcher, M.D., Emporia
First Vice President	*John M. Porter, M.D., Concordia Karl E. Voldeng, M.D., Wellington
Second Vice President	Clyde W. Miller, M.D., Wichita Frederick E. Wrightman, M.D., Sabetha
Constitutional Secretary	*Dale D. Vermillion, M.D., Goodland Albert C. Armitage, M.D., Hutchinson
Treasurer	*John L. Lattimore, M.D., Topeka Dwight Lawson, M.D., Topeka
AMA Delegate	George F. Gsell, M.D., Wichita Cyril V. Black, M.D., Pratt
AMA Alternate	*Peter E. Hiebert, M.D., Kansas City Lee H. Leger, M.D., Kansas City

The Nominating Committee is composed of Dr. J. H. A. Peck, St. Francis, chairman; Dr. William P. Callahan, Wichita; Dr. Noble E. Melencamp, Dodge City; Dr. William M. Mills, Topeka; Dr. Henry N. Tihen, Wichita.

DEATH NOTICES

ROBERT BENJAMIN STORTZ, M.D.

Dr. R. B. Stortz, 35, an active member of the Lyon County Medical Society, was killed instantly on Christmas eve in a highway collision. He was en route from his home in Madison to Galena, where he planned to spend Christmas with relatives.

Dr. Stortz was graduated from Washington University School of Medicine in 1942, after which he entered the Army medical corps and served in the E.T.O. during World War II. He began practice in Galena when he was discharged from the Army in 1945, moving to Madison two years later.

* * *

WILLIAM BROWN NEWTON, M.D.

Dr. W. B. Newton, 74, who had practiced in Glasco for 47 years before his retirement in 1947, died in Glendale, California, on January 7, after an illness of more than a year. He was a graduate of Central Medical College, St. Joseph, Missouri, and had taken postgraduate work at the University of Tennessee. During his practice he was an active member of the Cloud County Medical Society, an organization he served as president for two years, and since his retirement he has been an honorary member.

* * *

PAUL MORTON KRALL, M.D.

Dr. P. M. Krall, 68, Kansas City internist, died at his home on January 23 from a chronic heart ailment. He had suffered recurrent attacks since 1945, but preferred continuing his practice to retirement. He was graduated from St. Louis University School of Medicine in 1912. During World War I he served in the Army in France, and later practiced in Kansas City, Missouri. He moved his office to Kansas in 1921, and for many years was a member of the faculty at the University of Kansas School of Medicine. He was an active member of the Wyandotte County Medical Society.

* * *

ORLIN PEARL WOOD, M.D.

Dr. O. P. Wood, 73, died January 16 at Marysville after several years of poor health. He was an active member of the Marshall County Society. Dr. Wood was graduated from the University Medical College of Kansas City in 1900 and received his Kansas license in 1901. He practiced first at Halls Summit, then at Oketo, and began practice in Marysville in 1931.

Case Reports From The University of Kansas Medical Center Tumor Conference*

Carcinoma Involving the Esophagus

Edited by Harlan I. Firminger, M.D., and Irwin Joffe, M.D.**

Dr. Helwig: Two cases of carcinoma are presented, one of the upper end of the stomach, involving the esophagus from below, and the other a primary carcinoma of the esophagus. Both of these cases present a number of interesting features, and both were successfully operated upon. We will bring out as we go along some of the highlights of this rather distressing condition.

Case No. 52-107

Dr. Brooker: This is a 70-year-old man. Three months prior to coming to the hospital he noted a large amount of "phlegm" accumulating in his pharynx, which he continually had to cough up. Shortly after that he had some teeth extracted and, like so many patients, he blamed all of his trouble on the dental extractions. He was sure that that was the onset of his trouble and the cause of everything; but actually the difficulty started before that. Soon after he had his teeth extracted, he had more difficulty in swallowing and finally he began regurgitating his food shortly after eating. On regurgitation the food appeared to be the same as it was when he swallowed it; no digestion had taken place.

When we saw this man he looked normal for a man of 70 years except for evident weight loss. An esophagoscope was passed and a biopsy was taken from a narrowed portion which microscopically showed only esophagitis. Our diagnosis was based chiefly on the x-ray findings. Could we see the x-rays on the case?

Dr. Montgomery: Ingestion of barium solution revealed a sharp level of retention in the lower esophagus. There was delay in the passage of barium through a constricted area in the lower two inches of esophagus, with filling defects and a mottled pattern that can be seen extending into the stomach. When the patient was placed in the Trendelenburg position, filling defects were also seen in the fundus of the stomach. The x-rays suggest an intraluminal mass below the point of obstruction. The irregularities in the fundus were best seen fluoroscopically as barium passed over the filling defects in small quantities, but it is not sharply demarcated as carcinoma of the esophagus usually is; instead, the esophageal lumen tapers through the defective area.

Dr. Brooker: From the x-rays, it is evident that there was a carcinoma primary either in the esophagus or in the stomach. The treatment of course is the same. This man had an esophagogastrectomy through the left chest. His diaphragm was split after opening the chest, the stomach was brought up into the chest and anastomosed to the esophagus above the lesion where it was resected. During the operation we found that he had a large number of lymph nodes involved along the lesser curvature of the stomach. Whether all of those nodes were removed or not is questionable. He has done very well postoperatively.

Dr. Helwig: Thank you, Doctor. Would you care to comment on the difficulties of biopsy of this lesion, Dr. Kittle?

Dr. Kittle: I believe that on examination of the gross specimen it is readily apparent why it was not recognized better at esophagoscopy; the adeno-

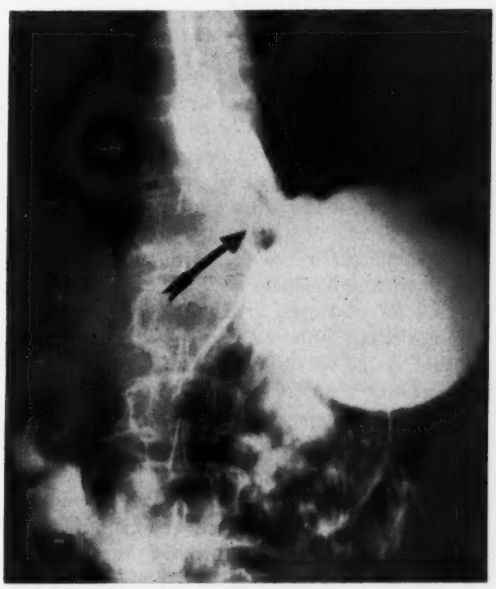

Figure 1. Case No. 52-107. Roentgenogram of the barium-filled esophagus and stomach illustrating irregular filling defect (arrow) in the lower esophagus at the junction with the stomach.

*Cancer teaching activities aided by a grant from the National Cancer Institute, U. S. Public Health Service, and the Kansas Division of the American Cancer Society.

**Trainee of the National Cancer Institute.

carcinoma arising in the stomach had infiltrated the submucosa of the esophagus, but the mucosa of the esophagus was still continuous down to the cardiac orifice. I feel certain that the only thing that could have been seen through the esophagoscope was extraluminal compression until one was well within the stomach, and then one should have seen polypoid growth. Actually, the biopsy was taken from the esophagus and revealed only esophagitis.

Dr. Helwig: Dr. Boley, would you discuss the pathological findings?

Dr. Boley: The specimen consists of the lower esophagus and about two-thirds of the stomach. The pearl-gray mucosa of the esophagus as it approaches the stomach narrows down to a point and forms a little cleft. On either side of this squamous epithelial wedge is tumor with ulceration. The tumor involves the fundus of the stomach for seven or eight cm. from the esophagus. It is firm, projects above the surrounding mucosa, and has a well defined rolled edge. Microscopically it is an adenocarcinoma with many atypical glands. The regional lymph nodes included in the specimen have hyperplastic germinal centers, but there is no tumor in any of those that we found.

It would be a little unusual, I should think, for a primary tumor of the esophagus to extend seven or eight cm. into the stomach and not go up the esophagus more than this one has. So I think we are justified in assuming that this tumor arose in the stomach and extended up into the esophagus.

Dr. Helwig: Dr. Kittle, would you resume discussion on this case, please?

Dr. Kittle: This is rather a typical history for this disease; that is, carcinoma at the lower end of the esophagus or the cardiac portion of the stomach. I would like to pass from this patient to a more general discussion of the entire problem of carcinoma of the stomach. All those interested in surgery, and medicine in general, can take a great deal of pride in the many advances that have been made in the treatment of this disease during the last 15 years. Although it has been over 70 years since Billroth first successfully resected a portion of the stomach for carcinoma of the stomach, it has been only in the last 10 or 15 years that any appreciable increase in the survival rate and the present cure rate has been achieved.

Now, let me be more specific about some of these rates for cures and five-year survivals. About 10 or 15 years ago, the over-all five-year survival rate for carcinoma of the stomach was quoted as less than five per cent.[1] In the last survey that Dr. Wangensteen[1] did from his cases at the University of Minnesota, he reported a 64 per cent five-year survival of patients with carcinoma of the stomach if the lymph nodes were not involved. In those instances where the lymph nodes were involved by carcinoma, he found a 12 per cent five-year survival. I think that is in marked contrast to the very discouraging picture that has been known in the past. Some of the advances responsible for this very marked change in the outlook of patients with carcinoma of the stomach have centered about the achievements in general that have afforded surgeons the opportunity of doing longer operations and more radical procedures.

The first total gastrectomy was done in 1897.[1] It is now the accepted procedure for most carcinomas of the stomach. This is necessary because of the lymphatic spread of carcinoma of the stomach and the necessity for removing the entire stomach as well as its attached tissues in order to eliminate these areas of lymphatic spread. Always with carcinoma of the stomach one attempts to remove the greater omentum if possible, as well as all of the mesentery and the omentum along the lesser curvature. Recently it has been suggested[2] that along with total gastrectomy one should also remove the distal half of the pancreas, as well as the spleen, again because of invasion in these directions. Now many of these patients, although they may not be offered the opportunity of a five-year survival, do have a remarkable degree of palliation after gastric resection. This may be true even in patients who at the time of operation have hepatic metastases. I think everyone is aware of cases in which the primary lesion was resected, along with a metastasis in the liver; many of those patients survive for several years.

Dr. Helwig: Dr. Friesen, can you tell us something about the "second look" plan that Dr. Wangensteen[1] has devised for carcinoma of the stomach?

Dr. Friesen: As Dr. Kittle has pointed out, the prognosis of the patient with carcinoma of the stomach varies, to large extent, with the presence or absence of lymph node metastases. Essential to the success of the surgeon in removing these lymph node metastases is an accurate knowledge of the location of the lymph nodes commonly involved. In an effort to find out where the metastases occur, Dr. Wangensteen did what he called a "second look" operation. Several of us now have done quite a number of "second look" operations. I think Dr. Wangensteen has done over 60. In this way, he would learn where the metastases occurred and could excise those lymph nodes at the second operation and possibly prolong the life of the patient. He has repeated these "second look" operations on individual patients until no cancer remained. In one instance, he re-explored a patient six times, and at the seventh operation found the abdomen free of tumor. Now this doesn't occur very often, but the great value in these "second look" procedures is to determine where the metastases occur, so that a

more intelligent primary resection can be carried out. The prognosis in "second look" operations with carcinoma of the colon and rectum is even better than are those with cancer of the stomach.

Dr. Helwig: I would like to question either Dr. Friesen or Dr. Kittle concerning the 64 per cent of patients who obtained five-year arrest; what percentage of those carcinomas were so-called "ulcer cancers?" My reason, of course, for asking this question is that there is a very great divergence of opinion among both surgeons and pathologists in regard to the incidence of "ulcer cancer." The cited incidence ranges all the way from Walter Palmer's[3] figure of zero up to the original work of Wilson and MacCarty[4] in 1909, in which they state that 71 per cent of all carcinomas spring from ulcers.

And a further point that I think will probably enter into this almost unbelievably good outlook for what has previously been a pretty hopeless condition will be the histologic interpretation of what is an early carcinoma. Some, of course, feel that there is no such thing—that if one finds a carcinoma growing in an ulcer, one is dealing with an ulcerated carcinoma, possibly carcinoma in situ with secondary ulceration. We know that those lesions can completely heal. Palmer[3] has a case that healed completely, apparently as a result of sloughing of the entire carcinoma; and yet lymph nodes containing metastases were found. It's conceivable that the whole cancer could be sloughed. We all know that in a fair percentage of cases, patients with cancer with an ulcer history will show marked improvement under medical management. So it's possible for the ulcer, even in a cancer, to heal completely. In fact, they have been found to have been "healed" with the bed covered with cancer cells. The roentgenologist can tell you that healing, either roentgenologically or gastroscopically, is not definite assurance that one is not dealing with a cancer of the stomach. It remains uncertain whether these lesions represent an abnormal proliferation at the edge of an ulcer incident to incarceration and distortion of glands with scarring, or whether they actually constitute a true carcinoma. And that is going to be, I am afraid, at least a significant percentage of your 64 per cent. How do you feel about that, Dr. Friesen?

Dr. Friesen: I believe the percentage will be significant, but it can't be overwhelmingly important because of this fact: if 88 per cent of all patients with cancers of the stomach are explored, they cannot be selected very carefully; and if resection is carried out in 78 per cent, again one can't be choosing patients very selectively. And so the "ulcer cancer" patients can't be a large portion.

Dr. Helwig: I want to point out that in Dockerty's[5] material at least, he is unable to determine—and the surgeon at the operating table and the pathologist with the tumor in his hand are unable to determine grossly—whether the ulcer is cancerous or not in about 18 per cent of cases.

Dr. Friesen: Very difficult. As you say, the figures vary, but surely almost everybody agrees now that the error in diagnosis is from 10 to 20 per cent; don't you agree?

Dr. Helwig: I think so.

Dr. Friesen: I would like to relate at this point an experience I had when I studied 13 consecutive patients with gastric ulcer. Operation was postponed and the patients were treated medically very vigorously, with frequent feedings, and so forth, in an effort to get these ulcers to heal. This treatment was continued for six weeks and the ulcers healed, as shown by x-ray visualization and by gastroscopy; then we operated upon them. Of these 13 patients, three were found to have carcinoma, which again puts the incidence of carcinoma in gastric ulcers at about 20 to 25 per cent. These areas were practically healed and the carcinoma, as you mentioned, was very difficult to find, but it was present microscopically in these three patients.

Case No. 52-108

Dr. Brooker: A 74-year-old white man had difficulty in swallowing and some increase in mucus production for 2½ months. His difficulty in swallowing progressed, but he never became so obstructed that he regurgitated very much. Occasionally he vomited after eating, but this was not one of the main points in his history. He lost a large amount of weight. When we saw him, the physical examination did not reveal very much and gave us no lead as to his primary disease. Again, his upper gastrointestinal series was most helpful in revealing his lesion.

Dr. Montgomery: A barium swallow revealed the presence of a lesion in the esophagus. There was no marked obstruction at the upper end of the lesion. Distally, the barium passed into an irregular channel at a level slightly above the arch of the aorta. The irregularity of the lumen extended distally for a distance of two inches. At the lower end of the lesion was an ulcer crater. Normal esophagus was seen a short distance below this ulcer. This is not the classical picture of carcinoma of the esophagus with sharp demarcation and a narrow constricted channel; this is an irregular filling defect with ulceration.

Dr. Brooker: This primary tumor in the esophagus was so high that it presented a problem in resection. This lesion was located at and above the arch of the aorta, which means that trying to resect it through the left chest would be difficult, so the abdomen was opened first. The stomach was drawn

up into the chest and the esophagus resected above and below the lesion, with a high anastomosis. At operation, this tumor was extensive; it had already spread beyond the esophagus, involving all of the tissues around the arch of the aorta, and all of the tumor probably was not resected. However, the tissue at the line of excision was satisfactory for anastomosis. This patient seemed to be getting along well after the operation, but died rather suddenly 15 days postoperatively.*

Dr. Helwig: Dr. Boley, will you present the pathological findings in this case?

Dr. Boley: The tumor occupied an oval area eight cm. in its greatest length on the right wall of the esophagus. At the narrowest point in the lumen, two-fifths of the circumference of the esophagus was involved by tumor. The appearance of an ulcer crater seen in the roentgenograms was caused by the sharp recession of the tumor from its prominent rolled lower edge. Microscopically, the tumor filled part of the submucosa and invaded deeply into the muscular coat of the esophagus. In places tumor cells involved the entire thickness of the wall. The tumor cells are relatively small. The nuclei are quite variable in size and staining; the cells have only a moderate amount of cytoplasm, which lacks the acidophilic staining of keratin. This lack of differentiation, however, is not uncommon in squamous cell carcinomas of the esophagus. Although ordinarily we think of squamous cell carcinoma as having intercellular bridges and forming pearls, most of the carcinomas of the esophagus that I have seen are not well differentiated.

*Subsequently a peptic ulceration developed in the stomach just below the site of anastomosis with perforation into the right lung. The patient died 15 days postoperatively from a sudden massive hemorrhage into the lung and gastrointestinal tract from this ulcer.

Figure 2. Case No. 52-108. Oblique spot film of the barium-coated esophagus showing irregular intraluminal filling defect posteriorly (arrows) in the esophagus at the level of the aortic arch and anteriorly as an irregularity and narrowing of the lumen. At the lower end of the lesion anteriorly there is an apparent ulcer crater.

Dr. Kittle: Carcinoma of the esophagus, again, is a lesion which only recently has attained any degree of curability. Dr. Billroth,[1] the first person to resect part of a stomach for carcinoma, in 1872 was also the first one to attempt any sort of esophageal resection. His first case was not successful, but about 10 years later there was a successfully treated carcinoma of the cervical esophagus by Czerny.[1] Thereafter surgical treatment progressed rather slowly. The first sucessfully treated case of carcinoma of the thoracic esophagus was that done by Torek[6] in 1913. In the middle thirties, there were very many successfully treated cases, this being the beginning of the modern thoracic approach to carcinoma of the esophagus.[7]

The level of the lesion determines the type of operation that is done. You will remember that carcinomas of the esophagus are most prevalent in the middle and lower thirds, being less common in the cervical portion of the esophagus. Like carcinoma of the stomach, it is more common in males, with the exception of carcinoma of the cervical esophagus, which is predominant in females. If we consider first the cervical esophagus, the area just below the clavicle and up to the pharynx, the modern day concept of resecting this area is to excise that portion of the esophagus and to restore continuity by means of a flap constructed from the skin (Wookey procedure[8]). There are many other ideas about reconstructing some sort of continuity between the pharynx and the lower portion of the esophagus, but the skin flap is the one most frequently used.

In the lower third, the esophagus can be approached easily from the left side. After resections of carcinoma of the lower third of the esophagus had met with success, attention was directed to carcinomas in the middle third of the esophagus. With lesions of the middle third, the anatomical relations of the esophagus are particularly important because it is in this area that the esophagus lies immediately to the right of the aortic arch, posterior to the trachea and in close proximity to the azygos vein.

The first attempts were made from the left side, and it was found that there was considerable difficulty in mobilizing the carcinoma from the arch of the aorta and from the azygos vein; dissection in

the region of both of these structures is hazardous because of the danger from hemorrhage. That led to the suggestion that a combined approach be introduced, and here, as Dr. Brooker has mentioned, the surgeon enters the abdomen as well as the chest. The abdominal approach also gives one an opportunity to examine the liver, so that if massive metastases are present, the operation can be abandoned. While in the abdomen, the surgeon mobilizes the stomach and the abdominal portion of the esophagus. He thrusts his finger through the esophageal hiatus up into the chest and sweeps it around the esophagus. Then the abdominal incision is closed, the patient is turned over on his left side, and a right thoracotomy is done. As one begins mobilizing the esophagus, the stomach slips up through the esophageal hiatus, becomes elongated and may be drawn up to the cupola of the thoracic cavity without any appreciable degree of tension. The stomach functions satisfactorily in this fashion. The portion of the stomach that does remain below the diaphragm becomes dilated over a period of weeks and months. These individuals at first can tolerate only small feedings; but as that remnant of stomach expands, they will frequently become able to eat large quantities of food, and in time will be able to eat regular sized meals.

We see a few complications secondary to this type of procedure. One is from division of both the vagus nerves, which must be sacrificed in resecting any part of the esophagus. That causes diarrhea, which usually persists for one to two weeks. It does not cause any persistent difficulty. The chief problem in these patients postoperatively is that of nutrition. That can be managed, however, by encouraging patients to eat only high caloric foods so that they do not occupy the small space that they do have by foods which do not have much caloric value. These patients usually lose a considerable amount of weight immediately postoperatively, but if their diets are carefully managed, persistent weight loss can be avoided.

Student: What is the cause of the diarrhea?

Dr. Friesen: There is a new theory that achlorhydria may produce diarrhea. The vagus does produce hypo- or achlorhydria. Giving acid to these patients will sometimes correct the diarrhea.

Dr. Helwig: Dr. Kittle, what percentage of your cancers of the esophagus as they come to you are resectable? I won't say curable, but resectable. Would you say 70 per cent?

Dr. Kittle: I do not recall any in the last year and a half that we have not resected. We feel that palliation by resection is worthwhile even in the presence of metastases.

Dr. Helwig: The first point that I think should be emphasized here is that if nothing is done to cancer of the esophagus, over half of the patients will be dead in eight months; whereas, if they are resectable, one can salvage at least a fourth of them for three years or longer. Anyone who has watched a patient die with cancer of the esophagus knows what an unpleasant experience it must be; if only the agonizing swallowing problem is relieved, much has been accomplished. So it's really a wonderful palliative procedure, even if not too frequently curative.

I'll ask Dr. Montgomery to comment on the management of the inoperable case and the ability of x-ray to palliate such cases by the rotation technic. Dr. Montgomery?

Dr. Montgomery: Squamous cell carcinomas of the type found in the esophagus are not radioresistant. However, they are difficult to treat adequately because of their inaccessible position. In recent years radiotherapy has been administered on a rotating table, so that instead of using several individual ports, the entire esophageal circumference is exposed to the x-ray beam as the patient rotates in front of the x-ray tube. A significant increase in arrest of tumor progress has resulted from this technic, especially when combined with supervoltage x-ray therapy in the range of one to two million volts.

Dr. Helwig: In most series, about three-fourths of the resectable cases will show extension to lymph nodes. Dr. Friesen, would you like to comment on this problem in esophageal cancer?

Dr. Friesen: I think the right-sided approach has allowed us to remove more carcinomas of the esophagus than before. Then, in line with what was said earlier, we have learned more about the locations of lymph node metastases. The right-sided approach and the abdominal incision have allowed us to remove involved lymph nodes in the region of the lesser omentum as well as the lymph nodes along the esophagus. It's the longitudinal type of metastases that we can remove with this type of operation, and I think that's going to show up five years from now in the higher survival rate.

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Reporting Communicable Disease

Editor's Note. The following request for co-operation from Kansas physicians was prepared for the Journal by Dr. Thomas R. Hood, executive secretary of the Kansas State Board of Health.

The State Board of Health needs the assistance of Kansas physicians in carrying on its work of communicable disease control. We have prepared this material to emphasize the type of disease outbreaks which are most likely to have serious significance and which may be amenable to control measures through co-operative work by physicians and local and state health departments.

The reporting of epidemics, or unusual occurrence of communicable diseases, will contribute to a better understanding of the behavior of epidemic diseases. It provides the type of information needed for the application of more effective preventive and control measures. There are civil defense aspects of this reporting. Kansas physicians are invited and urged to report immediately any unusual outbreaks by telephone or telegram. This special request should not be construed as replacing existing requirements on disease reporting.

The report of an outbreak in Kansas will be of value to adjoining communities, health officers in adjacent states, the Public Health Service, the Civil Defense Administration, medical officers in the Department of Defense, and to other federal and state agencies.

Since there is no definition of an epidemic which is acceptable to all persons under all types of conditions, the following statement has been prepared to indicate the principal types of unusual occurrences of infectious diseases for which immediate epidemiological reports are requested. We believe such reports will materially assist us in carrying out our proper duties.

Epidemiological reports are requested for the following types of unusual occurrences of communicable diseases:

1. All cases of smallpox, anthrax, botulism, psittacosis, plague, and rabies (animal and human)

2. Typhoid fever following a gathering such as a dinner or picnic, when one or more cases occur in which milk or water supply has been proved as suspected of being the vehicle of infection; or two or more cases having, or presumed to have, a common source.

3. All outbreaks in which water or food (including milk, milk products) are found to be or suspected of being the vehicle of infection, regardless of etiology.

4. All outbreaks of diarrhea of the newborn occurring in hospitals or institutions.

5. All outbreaks occurring in institutions (hospitals, boarding schools, orphanages, summer camps, etc.) regardless of their etiology.

6. Multiple cases of undiagnosed disease, especially when they occur in industrial groups.

7. High incidence of respiratory diseases, particularly during periods when influenza is likely to occur.

8. Occurrences of anthrax, psittacosis, plague, equine and St. Louis types of encephalomyelitis, and leptospirosis, in animals, since these diseases may spread to man.

9. Multiple or groups of cases of a disease occurring under unusual circumstances such as an uncommon mode of spread, a relatively high case fatality rate, and a high incidence of disease "out of season."

BLUE SHIELD

Waiting Periods

The subject of waiting periods in a hospital-surgical-medical plan has probably been discussed more than any other by trustees and administrative personnel. Most plans have had waiting periods and many of them still require membership for different lengths of time, before treatment of certain conditions. Originally, the Kansas plan required a waiting period of eight months for treatment of pre-existing conditions. This was a difficult and costly provision of the agreement to administer. Part of this comes from the necessity for much correspondence between the administering office and the participating physician to determine the date of the onset of a condition which is being treated.

This requirement was dropped from the Kansas membership agreement some years ago, to be replaced by an eight-month waiting period for treatment of certain stated conditions. However, in 1949, Blue Cross-Blue Shield eliminated all waiting periods except for maternal benefits and tonsillectomies. Since these two services account for 18.64 per cent of all payments made in Kansas, it is obvious that such a waiting period was important in maintaining an equitable rate structure.

Because of the increasing utilization of services, particularly in the area of elective treatment, it is now the feeling that some further consideration should be given to having waiting periods for some conditions other than maternity services and tonsillectomies and adenoidectomies. A fallacy of one school of thought on waiting periods is that they would be primarily designed to save the plan money. Actually, most of the elective conditions on which waiting periods might apply, could be postponed

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- narcotization

VESTIBULAR DYSFUNCTION associated with
- streptomycin therapy

VERTIGO in
- Ménière's syndrome
- hypertensive disease
- fenestration procedures
- labyrinthitis
- radiation sickness

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until the waiting periods had been served. So, in the long run there would not be much actual savings for the plan. It is now believed that the greatest value of waiting periods lies in the effect they will have in encouraging members to keep their memberships after they have served their waiting periods. It is the same as having accumulated a vested interest in something like a retirement program. One does not wish to drop a plan in which he has gained certain privileges which would be lost in cancellation.

Therefore, the amount of money saved would become of secondary value. A third advantage of waiting periods, but of minor importance, is the deterrent effect they might have on outright chiseling. They would tend to prevent people from joining and cancelling just to get benefits for recognized needs.

The total of all these factors now results in a new consideration of inclusion of some waiting periods in the membership agreement of Kansas Blue Cross-Blue Shield. If this comes about it will probably be in the category of such conditions and ailments which are prone to be pre-existing. This would include such categories as gynecology, prostatic conditions, hernias, rectal conditions and congenital anomalies.

ACTIVITIES OF MEMBERS

Dr. Albert L. Bonfanti, Ellis, closed his office last month to report for duty with the armed forces.

* * *

Dr. Herbert L. Bunker, Jr., has returned to his practice in Junction City after spending 16 months in Korea as physician in charge of a prisoner of war camp on the southern coast of the country.

* * *

Dr. S. Paul Hornung, who has been associated with the Dodge City Medical Center, was called to service with the Army Medical Corps last month and reported for duty in Texas. Before leaving he resigned as coroner of Ford County, and Dr. James O'Shea was appointed to the position.

* * *

Dr. C. A. Hellwig, of the Hertzler Clinic, Halstead, was recently elected a member of the German Society for Pathology.

* * *

Dr. Victor E. Watts, who has practiced in Smith County for 45 years, was recently honored by the Smith Center Rotary Club for "service above self." Dr. Watts is the first person to receive that honor from the club.

* * *

The office of Dr. Dean C. Chaffee, Abilene, which was closed recently when Dr. Chaffee reported for military duty, was opened last month by Dr. Charles C. Gilkey, who had just returned from service in Korea. Dr. Gilkey will practice in association with Dr. Chaffee when the latter's term of duty is completed.

* * *

Dr. J. W. Jacks, Pratt, closed his office on January 1 and reported at Corpus Christi, Texas, on January 8 for duty with the Navy.

* * *

Dr. L. L. Cooper, Fort Scott, announces that Dr William A. Kells, formerly of Kansas City, is now associated with him in practice. Dr. Kells is a recent graduate of the University of Kansas School of Medicine and has been practicing recently in Pleasanton.

* * *

Dr. James E. Bresette was recently released from active duty with the Navy and has resumed practice in Kansas City, specializing in ophthalmology.

* * *

Dr. P. L. Beiderwell, Belleville, announces that Dr. Alex Scott, a graduate of the University of Wisconsin who recently completed a two-year tour of duty with the Army Air Force, is now associated with him in practice.

* * *

Dr. Lawrence J. Ruzicka, Concordia anesthesiologist, has become a member of the staff of the Gelvin-Haughey Clinic there.

* * *

Dr. James H. Enns, who has been serving with the Navy for two years, has returned to his civilian practice in Newton in association with his brother, Dr. E. K. Enns. During the past 14 months Dr. Enns was aboard the hospital ship USS Consolation, serving in Korean waters.

* * *

Dr. Shirley Clark has resumed practice in North Topeka after having spent two and a half years with the medical department of the Air Force, most recently in Mississippi.

* * *

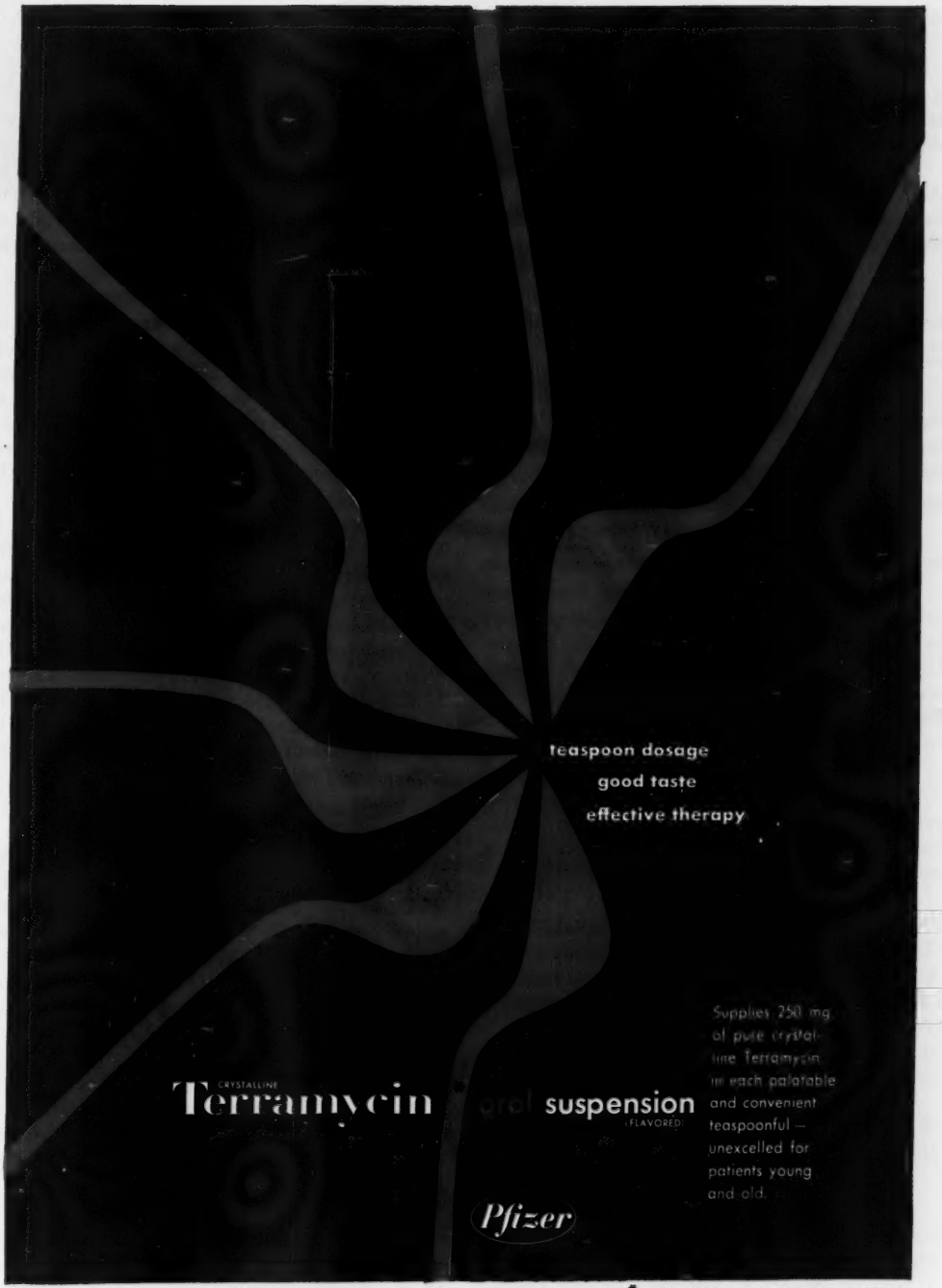
Dr. Leon F. Kinnan, Caldwell, spoke on cancer research before a recent meeting of the Caldwell Starlight Study Club.

* * *

Dr. Lewis G. Allen, Kansas City, is attending a four-weeks course in the technique of using radioisotopes at the Oak Ridge, Tennessee, Institute of Nuclear Studies.

* * *

The Dodge City Medical Center announces that Dr. E. W. Schwartz, who has been practicing in Kinsley, is now a member of its staff.



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DON'T MISS Spectrum APPEARING REGULARLY IN THE J. A. M. A.

Dr. Robert W. Myers, Newton, described medical care for the armed forces in Korea in a recent address to the Halstead Lions Club.

* * *

Dr. J. L. Lattimore, Topeka, was guest speaker at a meeting of the St. Anthony Murdock Hospital staff in Seneca on January 19. He discussed pathological and legislative matters.

* * *

Dr. Frederic O. Epp, Augusta, went to New York last month to attend a two-day meeting of medical personnel of Socony-Vacuum Oil Company, Inc.

* * *

Dr. W. W. Kridelbaugh, Arkansas City, has been notified of his recall to service in the Navy. He is to report on May 8.

* * *

Dr. John G. Shellito, Wichita, spoke on "The Need of a Tuberculosis Sanatorium in Wichita" before the Sedgwick County Medical Assistants' Society on January 21.

COUNTY SOCIETIES

A meeting of the Harvey County Society was held on January 5. Scientific papers were presented by Dr. Charles Pokorny and Dr. J. W. Hertzler. Dr. Quinton Cramer of the Bethel Clinic, Newton, was received as a new member, and Dr. James H. Enns, who has been in military service, was welcomed back by the group.

* * *

Dr. Michael J. Cox, Dodge City, was elected president of the Ford County Society at a meeting held recently. Dr. Arnold H. Baum, Dodge City, was named secretary-treasurer.

* * *

Dr. Clyde W. Miller, Wichita, was speaker at the December meeting of the Cowley County Society. A business session was also held, and the following officers for 1953 were elected: president, Dr. Roscoe F. Morton, Arkansas City; vice president, Dr. M. W. Wells, Winfield; secretary, Dr. Newton C. Smith, Arkansas City; delegates to the state society, Dr. James E. Hill, Arkansas City, and Dr. A. Y. Wells, Winfield; board of censors, Dr. C. C. Hawke, Winfield.

* * *

Members of the Shawnee County Society were hosts to the Golden Belt Medical Society at a meeting held at the new Medical Society Building in Topeka on January 8. For the afternoon program Dr. Hubert M. Floersch, Kansas City, spoke on "Sterility," Dr. H. L. Hiebert, Topeka, and Dr. Frank Hoecker, Lawrence, discussed "The Development of Clinical Radioisotope Centers in Kansas," and Dr. W. Clarke Wescoe, dean of the University of Kansas School of Medicine, outlined activities at the medical center. A dinner and business session followed the program.

* * *

Dr. H. W. Jury, Claflin, was made an honorary member of the Barton County Society at its December meeting in recognition of his 50 years in practice. The following officers were elected to guide the society's activities in 1953: president, Dr. Homer B. Russell, Great Bend; vice president, Dr. M. O. Steffen, Great Bend; secretary-treasurer, Dr. L. J. Robison, Hoisington.

* * *

Dr. Harry J. Davis took office as president of the Shawnee County Medical Society in January, and will be assisted during the year by the following additional officers elected at a meeting held in Topeka in December: president-elect, Dr. Francis T. Collins; vice president, Dr. D. Bernard Foster; secretary, Dr. Vernon C. Wiksten; treasurer, Dr. Willis L. Beller.

At the meeting special honor was given Dr. W. L. Warriner, 90, only living charter member of the society. He and 13 other physicians, all having reached the age of 85 or having completed 50 years of practice, were awarded special pins to show membership in the 85-50 club. In addition to Dr. Warriner, the following received pins: Doctors W. L. Borst, M. A. Floersch, Ralph L. Funk, W. H. Greider, H. B. Hogeboom, C. H. Kinnaman, C. H. Lerrigo, J. H. McNaughton, C. F. Menninger, John F. Northrup, M. L. Perry, J. C. Shaw, and C. L. Youngman.

* * *

A business meeting of the Miami County Society was held at the state hospital in Osawatomie in December. Dr. William Brown, Paola, was named president for 1953; Dr. Clifford Van Pelt, Paola, vice president; Dr. Charles H. Johnson, Osawatomie, secretary-treasurer, and Dr. W. L. Speer, Osawatomie, delegate to the state meeting. An English medical film was shown for the program.

* * *

Members of the Anderson County Society held a joint meeting with the R. N. Club at Garnett in December. Two films were shown, one on "Allergy" and the other on "Utilization of Food Energies."

The following officers of the medical society, all from Garnett, were re-elected: president, Dr. Mildred Julius Stevens; vice president, Dr. C. B. Harris, Jr., and secretary-treasurer, Dr. R. E. White.

* * *

Dr. Glenn R. Peters was named president of the Wyandotte County Society at a meeting held in December and was installed in the office at a dinner

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meeting at the Town House, Kansas City, on January 10. Dr. Mahlon H. Delp was named vice president; Dr. P. E. Hiebert, secretary, and Dr. Agnes L. Robbins, treasurer. Dr. Galen M. Tice was elected to the board of censors, and the following were chosen as delegates to the state meeting: Doctors Clifford J. Mullen, Lee H. Leger, Rolla L. Strobach, Frank J. Strick, Gaylord P. Neighbor, and William F. Roth, Jr.

* * *

A meeting of the Crawford County Society was held December 18 at Pittsburg, and the following Pittsburg physicians were elected to office for 1953: president, Dr. Howard R. Elliott; vice president, Dr. Earl E. Miller; secretary-treasurer, Dr. David J. Lyons.

* * *

Dr. John C. Mitchell is the new president of the Saline County Society, Dr. Henry S. Dreher, Sr., is vice president, Dr. Oliver L. Martin is secretary, and Dr. Max S. Lake is treasurer. All practice in Salina.

* * *

Officers of the Atchison County Society were elected at the December meeting held at the Atchison Hospital. Dr. Robert O. Brown was named president, Dr. George A. Patton, vice president, and Dr. I. R. Morrison, secretary-treasurer.

* * *

Dr. Robert E. Riederer, Olathe, was elected president of the Johnson County Society at a meeting held last month at the Green Parrot Inn. Dr. George J. Pierron, Olathe, was named secretary-treasurer.

* * *

Members of the Montgomery County Society entertained their wives at a dinner meeting at the Hotel Dale, Coffeyville, in December. Dr. W. Clarke Wescoe, dean of the University of Kansas School of Medicine, was speaker. A business session was held and Dr. Rodney Carter, Independence, was named president for 1953 with Dr. Harold O. Bullock, Independence, as secretary.

* * *

The occasion of the 50th anniversary of the Sedgwick County Medical Society was marked with a celebration banquet held at the Broadview Hotel, Wichita, on January 19. Four hundred persons attended, physicians and their wives and guests.

Honored at the meeting were those member physicians who have practiced 50 years, Doctors B. C. Beal, D. G. Buley, J. W. Cheney, J. E. Chipps, J. D. Clark, A. E. Gardner, J. F. Gsell, A. P. Gearhart, T. T. Holt, H. W. Horn, J. A. McLaughlin, A. R. McReynolds, D. I. Maggard, C. A. Parker, F. H. Slayton and A. D. Updegraff.

The speaker of the evening, introduced by Dr. W. J. Kiser, was Dr. Lewis A. Alesen, president of the California Medical Association. His subject was "Economics and Medical Progress." Preceding the address was the following program: invocation, Rev. Coyd Taggart; introduction of guests, Dr. W. J. Kiser; introduction of new president, Dr. B. R. Meeker; presentation of past president's gavel and recognition of 50-year physicians, Dr. H. C. Clark; prospectus of coming events, Dr. G. F. Corrigan; music, Jeannie Park Gans and Myrth McGaugh Culp.

* * *

A meeting of the Rush-Ness Society was held at the Rush County Memorial Hospital on January 12. Dr. Otis True, Hays, was guest speaker. At the business session Dr. Robert E. Grene was elected president for 1953 and Dr. K. F. Bowser was named secretary.

* * *

Dr. E. LaMonte Gann, Kansas City, was guest speaker at a meeting of the Douglas County Society held at Lawrence on January 13. He discussed hearing problems.

* * *

A meeting of the Riley County Society was held at the Gillette Hotel, Manhattan, on January 21. Mr. Oliver E. Ebel, Topeka, spoke on activities of the Kansas Medical Society.

* * *

The Wilson County Society met on January 14 at the office of Dr. Raymond J. Beal, Fredonia. Officers were elected and Dr. Beal was chosen president for 1953. Dr. Galen M. McCray, Neodesha, was named vice president and Dr. Charles E. Stevenson, Neodesha, secretary-treasurer.

* * *

A meeting of the Wyandotte County Society was held at the City-County Health Building, Kansas City, on January 20. Dr. John H. Mayer, Jr., spoke on "Surgery of Mitral Stenosis."

Frozen orange juice concentrate, unknown a few years ago, is now used by 28.5 per cent of American families. Frozen concentrate purchased during the first half of 1952 made 26,731,000 gallons of reconstituted juice, or 94 per cent more than was consumed during the same period in 1951. The figures were reported to the Florida Citrus Commission by the Market Research Corporation of America. Convenience, year-round availability and excellent vitamin C retention are among the reasons assigned for the rapid growth of the new food item.

The sixth annual clinical session of the American Medical Association, held in Denver early in December, was the largest medical meeting ever held in the Rocky Mountain area. The total registration was 6,733, including 2,614 physicians.

50 and Six

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Senior Thesis from the University of Kansas Medical School*

The Use of Isoniazid in the Treatment of Tuberculosis

Donald L. Cooper**

Kansas City, Kansas

On discovering the tubercle bacillus in 1882, Koch said that tuberculosis was the greatest killer of human beings among all the diseases. In spite of the tremendous strides made in chemotherapy of bacterial infections and man's increased scientific knowledge, what Koch said then is still true today. It is estimated that between five and six million people are killed yearly throughout the world by the tubercle bacillus.[1]

Tuberculosis is almost unique among bacterial diseases in that it has remained intractable to the common antibiotics such as penicillin, aureomycin, terramycin, and chloramphenicol as well as the multitude of "sulfa" drugs. It has been taught and thought for many years that this resistance was due to the waxy capsule surrounding the organism. Therefore, before anything could affect this organism, it must first penetrate this waxy capsule, presumably as a fat soluble material. It has now been shown that fat solubility is not required. In fact all of the effective tuberculostats known to date are either water soluble or associated with water solubility rather than fat solubility.[1]

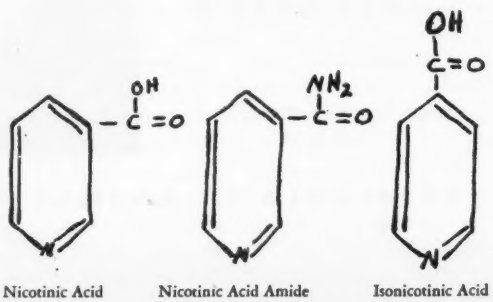
Other problems encountered in the treatment of tuberculosis are the chronicity of the infection and the associated difficulty in getting a drug to the organism because of mechanical barriers imposed by necrotic and fibrotic tissue, caseation, and incorporation of bacilli in phagocytes. Because of these difficulties it is very likely that no drug will ever be found that can cure chronic tuberculosis with the speed and effectiveness of penicillin in other and more acute bacterial infections. Due to the amount of tissue destruction in chronic tuberculosis, even a powerful tuberulocidal agent would still cure slowly because of the slow processes of healing and regeneration of tissue. From the aforementioned phenomena, it becomes more apparent that for successful treatment with chemotherapy, early diagnosis is essential.[2]

The clinically effective therapeutic agents for tuberculosis may be divided into two main classes: the antibiotics and the synthetics. The former group consists chiefly of streptomycin and dihydrostreptomycin. The latter group is generally divided into four categories: the sulfones, the aminohydroxybenzoic acids, the thiosemicarbazones and the pyridine carboxylic acid derivatives. It is in the pyridine carboxylic acid group that we find isoniazid.[1]

By way of background and history, it was in 1945 that Chorine and Huant discovered the tuberculostatic activity of the vitamin, nicotinamide. It wasn't until 1948 that McKenzie and Kushner in the United States worked on this problem, and they postulated that activity against the tubercle bacillus was a function of nicotinamides vitamin radicle. This was more recently disproved by Fox[1] in his investigations of pyradine carboxylic acid derivatives. He demonstrated compounds that were tuberculostatic without vitamin activity. This opened up a large field to be investigated by its indication that possibly any of the pyridine structure compounds could be tuberculostatic. This idea led Fox to the study of the thiosemicarbozones. In the preparation of one of the thiosemicarbozones, isoniazid is created and combined with other compounds to form the desired thiosemicarbozone. In submitting some of the isoniazid for study in the laboratory, it was found to have an in vivo antitubercular activity that far exceeded that of any other known substance.[1]

Isoniazid is not a new compound. It was synthesized as an academic exercise by two candidates for a Ph.D. in 1912.[3] It was never used again until the present. At approximately the same time Fox was working in the Hoffman-LaRoche laboratory, researchers at E. R. Squibb and Sons had independently discovered the anti-tubercular properties of isoniazid.[4]

To better understand the relationships of the various compounds already mentioned, several of the more important ones are shown structurally:



Nicotinic Acid — Nicotinic Acid Amide — Isonicotinic Acid

*This is one of 11 senior theses selected for publication by the Editorial Board from a group of 15 judged the best by the faculty of the University of Kansas School of Medicine.

**Senior Student, University of Kansas School of Medicine.

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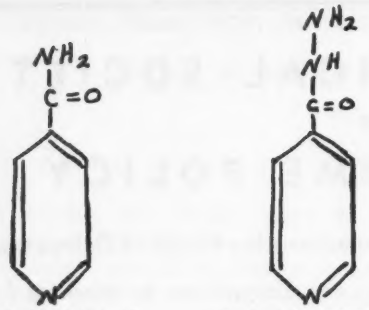

Isonicotinic Acid Amide

Isonicotinic Acid Hydrazide (Isoniazid)

Isoniazid is an almost colorless crystal which is soluble in water. The activity in vitro has been outstanding. Isoniazid is bacteriostatic against M. tuberculosis H37Rv in a concentration as low as .015 micrograms per milliliter.[5, 8] This activity seems to be fairly specific for tubercle bacillus as isoniazid was ineffective in vitro against the common gram-negative and gram-positive pathogenic bacteria, against certain protozoa, and against influenza virus in mice. It may possess some slight anti-fungal properties.[8]

Mackaness and Smith,[9] using isolated rabbit macrophages as a medium, found that isoniazid differs from most antituberculous drugs which have been tested in that its activity is not significantly lowered by an intra-cellular location of the tubercle bacillus. The drug apparently enters freely into cells and exerts its full bacteriostatic action in this environment. This is an advantage over streptomycin, which suffers considerable reduction in activity against intracellular bacilli.[37]

The activity in vivo has also been promising. In such experimental animals as mice, rabbits, monkeys, and guinea pigs, isoniazid effectively arrested tuberculous infections with virulent human strains of M. tuberculosis.[5, 7, 10, 13, 38]

Toxicity in experimental animals has been thoroughly investigated and has been generally classified as acute, subacute, and chronic. With large doses up to 750 mg./kilogram of weight, the acute toxicity appeared as convulsions, gastrointestinal irritation, and death from respiratory failure. Subacute toxicity, from daily injections up to 50 mg./kilogram, produced gastrointestinal upsets, marked anemia and 100 per cent mortality within two weeks. Dogs tolerated a dose up to 3.5 mg./kilogram per day with no signs of toxicity. Doubling this dosage caused anemia, liver damage and kidney damage.[14, 16]

Oral administration is effective in securing a satisfactory blood and body fluid level, with peak plasma levels being reached in one to two hours. The compound is well distributed throughout the body in effective concentration, including blood serum, cerebrospinal fluid, and pleural fluid. As much as 50 to 70 per cent of the drug is excreted in the urine in 24 hours.[14, 15, 19]

The use of isoniazid in man at this time has been limited largely to patients with far-advanced pulmonary disease, extensive tissue destruction and positive sputum, usually those having considerable symptomatology. Most of these have failed to respond or would not be expected to respond to other available therapy. The dosage usually varied from three to five mg./kilogram per day, generally by the oral route.

The most striking and promising benefits are increased appetite and weight and general feeling of well being.

Robitzek, Selikoff and Ornstein[20, 22] reported 92 cases with bilateral progressive caseous pneumonic tuberculosis who had failed to improve on previous therapy. They all received isoniazid or its isopropyl or glucosyl derivative, the dosage varying from 4 to 10 mg./kilogram per day orally. Body temperatures fell in most cases, usually within two to three hours, and remained normal throughout treatment. The patients became more cheerful and energetic. Their appetites improved and a weight gain that averaged 18 pounds per patient was obtained, with many patients returning to normal weight after one to four months of treatment. Cough and expectoration were also diminished or eliminated by the end of two weeks in most patients. Some of the toxic symptoms of the disease disappeared rapidly as evidenced by increased muscle tone and skin turgor.

In fully one-half of these patients, however, there was no roentgenographic change. Sputum and gastric washings remained positive on smears in 75 per cent of those treated. In several patients there was a decrease in cavity size, and in a few patients the cavities were closed.

In another series of 44 patients with "hopeless" active progressive caseous pneumonic tuberculosis, Robitzek and Silikoff[21, 22] obtained similar results as mentioned above. One of the earliest signs of clinical response was restoration of normal skin turgor.

A good evaluation of the comparative effectiveness of isoniazid versus streptomycin and P.A.S. therapy was presented by the Medical Research Council of Great Britain.[39]

In this report, 331 cases were treated; approximately one-half were treated with isoniazid alone (200 mg. daily) and the other half were treated with streptomycin (one gm. daily) and P.A.S. (20 gm. daily). All forms of the pulmonary disease were treated, from acute rapidly progressive to chronic cases.

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March 19, 20 and 21, 1953

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BENJAMIN BOSHES, M.D., Professor and Head, Department of Neurology, Northwestern University Medical School, Chicago.

A. B. BAKER, M.D., Professor and Head, Department of Neurology, University of Minnesota Medical School, Minneapolis.

EDWARD C. WEIFORD, M.D., Neurosurgeon, Kansas City, Mo.

University of Kansas Faculty:

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MARVIN L. BILLS, M.D., Assistant Professor of Psychiatry and Neurology.

CHARLES E. BRACKETT, M.D., Instructor in Surgery (Neurosurgery).

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At the end of three months treatment it was concluded that isoniazid alone was very little, if any, more effective than streptomycin and P.A.S. It should be mentioned that one of the discouraging things in using isoniazid alone was the fact that at the end of two months, 52 per cent of the cases showed bacterial resistance; at the end of three months, 71 per cent showed bacterial resistance. In another series of cases treated with isoniazid and streptomycin together, it was found that resistance developed in only 15 per cent of the cases at the end of two months, as compared to 52 per cent in cases with isoniazid alone. They concluded most emphatically that isoniazid should not be used indiscriminately.

In three patients with advanced pulmonary tuberculosis who have been treated at the University of Kansas Hospital, the results have not been dramatic. One patient who has been on isoniazid, 100 mg. each morning and evening for 105 days, shows no improvement, and the patient's course continues to go down hill with progressive weight loss. Another patient who has taken isoniazid, 50 mg. three times a day for 32 days, has gained 12 pounds, appetite has improved, temperature has dropped, and there has been a definite improvement in attitude and outlook. The third patient has been on isoniazid, 50 mg. three times a day for 28 days, and shows a four-pound weight gain and some decrease in temperature, but no improvement in sense of well being.

Clark et al[40] reported results of isoniazid treatment in 15 cases of miliary tuberculosis and 15 cases of meningeal tuberculosis. There were two deaths among those treated, both dying within the first eight days after treatment was started and both having miliary and meningeal tuberculosis.

In 12 cases of miliary tuberculosis treated with isoniazid alone, the institution of therapy was followed by a uniform disappearance of clinical illness, regression of x-ray abnormalities, and a high incidence of reversal of infectiousness. It must be remembered that miliary tuberculosis is greatly different from caseous pulmonary tuberculosis.

It was felt by Clark et al that the results obtained with isoniazid in miliary tuberculosis were slightly superior to those previously obtained with streptomycin.[23, 24, 40]

A few of the meningeal tuberculosis cases responded favorably with isoniazid, but more time will be needed for full evaluation, and most of these cases also were receiving or had received streptomycin.[20, 24, 40]

At the University of Kansas Medical Center one patient with longstanding severe meningeal tuberculosis has been treated more than 60 days with isoniazid and shows no change in condition. It will probably be several months before any good detailed reports will be available that can give conclusive evidence of isoniazid's worth in this form of tuberculosis.

In the treatment of bone tuberculosis, Bosworth et al[25] reported six patients with draining orthopedic lesions that had been resistant to other forms of therapy. They were started on isopropyl isoniazid, 100 mg. three times a day.

There was improvement in all patients but one, who died only eight days after treatment was begun. Temperatures fell, pain was relieved, appetite and well being returned. The sinus washings became negative by smear in four weeks, with one exception. There were 15 sinuses draining and after therapy only five were healed, but it was felt the others improved. Robitzek et al[20] also report encouraging results with tuberculosis of the bones and joints.

Greenberger et al[26, 27] reported several patients with genitourinary tuberculosis who were treated with isoniazid, and they state that symptomatic improvement with reduction of general toxicity was the rule. They do report that no bacteriological cure is obtained and the possibility of drug resistant organisms developing must be kept in mind.

Laryngeal tuberculosis, gastrointestinal tuberculosis, and tuberculous otitis media have all been treated with isoniazid, and some cases appear to respond well.[20]

The toxic manifestations that have been described in man are as follows: vertigo, constipation, muscular twitching, insomnia, drowsiness, headache, weakness of legs, disturbed vision, tinnitus, hyperreflexia, frequency of urination, delay in starting stream, dryness of the mouth, exertional dyspnea, sexual stimulation, eosinophilia, anemia, rise of N.P.N., and skin eruptions.[21, 25, 31] With the doses so far given to man, no serious toxic reactions have occurred. Toxic manifestations are usually transient in character and most of them, when present, tend to subside after seven or eight weeks of therapy.

However, Fetterhoff[41] reports a patient who had epilepsy along with tuberculosis. He was treated with isoniazid and died in status epilepticus. He emphasizes the use of sufficient sedation with phenobarbital in epileptic patients who are to be treated with isoniazid.

Effective blood level concentrations as well as cerebrospinal fluid concentration in human beings are easily obtained with oral dosages of three to five mg./kilogram per day given in divided doses, usually three times a day. There is no evidence of cumulation in patients tested.[29]

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resistant to isoniazid have been obtained.[32, 35] Steenken et al[36] demonstrated increased resistance of organisms in 50 per cent of patients with tuberculosis. This resistance was evident after four to seven weeks of therapy. Steenken et al suggest that if bacteriological resistance relapses persist, cavity tuberculosis cannot be expected to yield to isoniazid unless it is combined with another drug, with surgery, or with both. Middlebrook[33] and Pansy et al[8] state that when isoniazid and streptomycin are used simultaneously, no drug resistance was found in cultures exposed to this combination.

Summary

Tuberculosis is killing more people than any other disease. This is due to several factors, one of the most important being the difficulty of getting an effective chemotherapeutic agent, if there is one, to the organism deep in a fibrotic, necrotic, caseated area, or located in phagocytic cells of the host.

If an effective chemotherapeutic agent is found, earlier diagnosis and earlier treatment will be needed if one plans to rid the world of this infection.

The clinically effective therapeutic agents now available are either from such antibiotics as streptomycin or from such a synthetic as isoniazid. Isoniazid's anti-tubercular activity was discovered independently by researchers of two different laboratories. It is an effective bacteriocidal agent on the tubercle bacillus both in vitro and in vivo. Both isoniazid and its isopropyl derivative appear to be of low toxicity. The dosage ranges from three to five mg./kilogram of body weight per day and is almost always taken orally.

Almost all of the cases treated so far have been ones with advanced disease of the lungs. In general, the response has been one of reducing fever, reducing cough and sputum, gains in appetite, strength, and weight, some clearing of disease on x-ray examinations, and elimination of toxic symptoms. In cases of earlier pulmonary tuberculosis treated with isoniazid alone, as compared to streptomycin and P.A.S., the results indicate isoniazid to be no more effective than streptomycin and P.A.S. The results from treatment of miliary and meningeal forms of tuberculosis are encouraging, but not enough work has been reported to make any further statements. Some of the other forms of tuberculosis that have been treated have responded, but there is still much more work and evaluation to be done.

The most common toxic manifestations have been constipation, increased reflexes, difficulty in starting micturation, positional hypotension, dizziness, mild anemia, eosinophilia, dryness of the mouth and headache. No serious toxic reactions have occurred, and most of the toxic signs observed have been transitory.

Tubercle bacilli are capable of becoming resistant to isoniazid in vitro and in vivo. By using both streptomycin and isoniazid, investigators were unable to develop resistant strains.

It must be emphasized that isoniazid has shown some ability to destroy the tubercle bacillus, but it probably should not be used alone and should be used only where competent control of the patient can be maintained. The basic principles of the treatment of tuberculosis should not be deviated from. Much more time and work will be needed to establish the final place, if there is one, for isoniazid in the treatment of tuberculosis.

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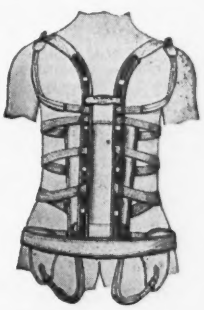

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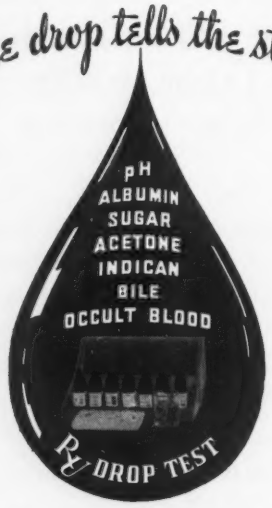

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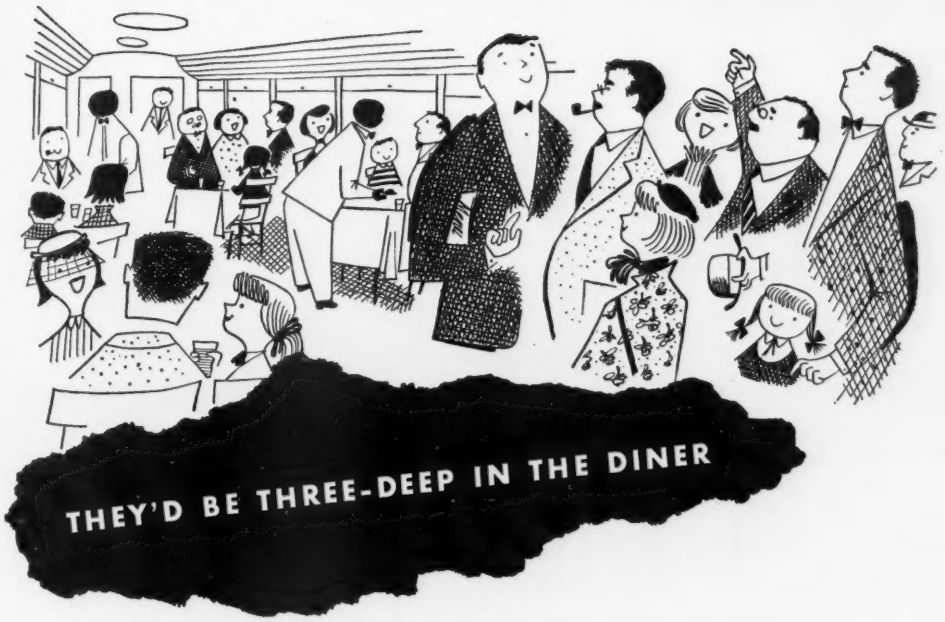

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Case after case from the 593 published reports shows that adjusted doses of short-acting NEMBUTAL can produce any desired degree of cerebral depression—from mild sedation to deep hypnosis.

And with only about half the dosage of many other barbiturates.

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Sodium capsule

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Especially indicated for premature infants. Contains 50 mg. ascorbic acid per ounce.

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